The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XVII. No. 422 JULY 30, 1927 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0.

Contents

	PAGE
EDITORIAL NOTES: Colonial Chemical Markets; Flotation of Oxidised Ores; Limestone for Metallurgical Purposes; I.C.I. Labour Policy	95
Prime Minister's Message to British Manufacturers	98
Collective Effort in Export Markets, by Sir Alfred Mond	99
Conditions of Demand and Distribution in Overseas Markets	100
Chemical Markets in the Empire	101
Indian Chemical Notes	103
Chemical and Allied Products in Canada	104
Electrometric Control in Industry	107
From Week to Week	112
References to Current Literature	113
Patent Literature	114
London Chemical Market	119
Company News; New Chemical Trade Marks; Tariff Changes	122

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.*

Editorial and General Offices: Bouverie House, 154, Fleet Street, London, E.C.4.

Telegrams: "Allangas, Fleet, London." Telephone: City 0244

Colonial Chemical Markets

IF the judgment of the House of Commons may be trusted, though many may decline to regard it as conclusive, the most direct way of developing our overseas trade is by encouraging ever-increasing exchange of goods between this country and its overseas dominions. In relation to the British chemical industry, at any rate, that principle is now accepted. Its acceptance does not involve any exclusion of other markets, which may continue to be explored as thoroughly as ever, nor does it imply any aggressive challenge to the rest of the world. What it does mean is that the British Empire is itself a great self-contained economic unit, composed of closely related peoples and interests, and that the organisation of its vast resources for the mutual good of all its parts, is the natural and obvious policy to be followed. That is the principle behind the formation of Imperial Chemical Industries. Its chief exponent, Sir Alfred Mond, has defined the policy in the simplest terms—"to interlock produce and manufactures, to interchange the flow of trade," and, one may venture to add, the economic utilisation of raw materials. From the chemical point of view, the object would appear to be, not to do less trade in foreign markets, but to do a great deal more in all our own.

At the Advertising Convention at Olympia last week, some of our greatest industrialists dealt with the problem of efficient machinery for the sale and distribution of British goods in overseas markets. In this issue are published, not only the message of the Prime Minister to British manufacturers, but the more specific views of Sir Alfred Mond, M.P., Sir Robert Hadfield, Viscount Leverhulme, and Mr. W. A. Cooke. Sir Robert Hadfield pointedly puts the whole case in emphasising the "vital necessity of scientific selling as the corollary to scientific production." It is obviously, as he says, of little use for the British manufacturer to spend large sums of money on research, on education, on up-to-date machinery to produce the best goods at the lowest price, unless equally competent means are employed in their marketing. Viscount Leverhulme says the same thing in other words—advertising and salesmanship must both be part of a carefully prepared plan; haphazard operations, in whatever volume, are of no more use in business than haphazard artillery fire in warfare. Sir Alfred Mond emphasises the need of collective effort in an organised and intelligent attack on Colonial markets. Brunner Mond and Co. have themselves built up a world organisation on these lines, with results well known to all. Collective effort, as Sir Alfred points out, cannot replace individual effort, nor is it ever intended to do so. The specialist, in any particular line, will still have his work to do. What it can do, however, is to construct a framework within which the individual firm can work more efficiently and more cheaply, to create an organisation of a general character that can be used by all, and to produce an atmosphere favourable to British trade expansion.

Supposing, then, that as the result of some general organisation of this kind an atmosphere specially favourable to British overseas trade is developed, what remains to be done by the exporting chemical or chemical engineering firm to capture the actual business? The first object is to discover the markets unexplored or only partially explored, and to keep informed of all new developments where chemicals or chemical plant may be needed. The next is to provide exactly what the potential customer in New Zealand or Canada or South America requires—not merely something that he ought to want, but something that he actually does want. The third is to tell him where it can be obtained with the least trouble. That is where effective advertising comes in, and Lord Leverhulme, who should know something of this subject, declares that it is the Press which has given to the industries of the country their greatest advertising medium.

We have more than once commented on the number

of inquiries we receive from overseas and from home consumers who desire to "buy British" but do not know the appropriate British producer. And the British producer must inevitably miss much custom of this sort because he imagines his goods to be as well known to everybody else as they are to himself; because he assumes it is the customer's duty to find out rather than his own duty to tell the customer. Until this essential link is supplied, there must be a serious gap between producer and consumer, and it is encouraging at last to find that the lack is realised and that efforts are being made to meet it.

Flotation of Oxidised Ores

SEVERAL of the more important mining companies in the western part of the United States and in Mexico are now operating flotation plants for treating oxidised ores, although the treatment of oxides by flotation was in its infancy as recently as ten years ago. Oxidised ores may be considered as ore whose components have undergone a change in chemical composition by natural weathering, usually from the sulphide form. The decomposition of minerals and changes in chemical components depend on the conditions and agencies involved. In weathering under common conditions, the sulphides oxidise to sulphates, and in turn, over long periods of time, under the influence of other agencies, the sulphates may change to carbonates and oxides—whichever may be the most stable form under existing circumstances. Thus in a deposit of oxidised ores there may be all gradations in transformation of minerals, from true sulphides to true oxides. Under more unusual chemical conditions, rarer compounds may be formed.

In comparing the flotation of oxidised ores in plant practice with the flotation of the sulphides, it appears that the former has borrowed the new reagents developed largely in the flotation of sulphides, and to these now adds sodium sulphide as almost the only sulphidising agent. There is still a tendency to use the heavier oils and tars to a greater extent than the latest practice for sulphide ores would deem feasible. The special reagents for oxidised ores developed in the various laboratories, as indicated by flotation patents, do not appear as yet to have been widely adopted in plant practice. Special frothing "oils" are, however, used in some plants. Sodium silicate is employed to some extent, probably to assist in excluding the slime present in most oxidised ores. A large tonnage of oxidised ore is being smelted directly. The economy of continuing this practice will depend largely on the balance between iron and silica in the smelter charges, as well as on the improvements in the art of floating oxidised ore itself. The amount of iron present in turn will depend largely upon developments in the concentration of the sulphide ores.

In looking over the developments in the flotation of oxidised ores since a fair start was obtained, say about 1916, the U.S.A. Bureau of Mines states that although new reagents have been tried, the percentage of the oxidised material recovered in usual plant practice has not greatly increased. The growth is more an increase in tonnage treated than in percentage of metals recovered. For the greater part, in plant practice the developments in the flotation of sulphide ores have been followed rather than new developments found by research work on the oxidised ores, and the oxidised valuable minerals themselves. The extent to which rarer minerals of oxidised ores occur, other than those commonly known, has not, perhaps, received due consideration. Since the chemistry and mechanism of sulphidising lead carbonate, for instance, appears to be relatively exact, failure to secure high recoveries when treating an oxidised lead ore by sulphidising and flotation may be taken as an indication that the ore contains constituents that are either not sulphidised at all or to such a slight extent as to have little effect on their flotability. Comparatively little is known regarding the possibilities of sulphidising many of the oxidised minerals and the content of these minerals in oxidised ores from various localities. Work done at the United States Bureau of Mines experiment station, Salt Lake City, on pure sulphide minerals has been productive of fundamental data on the mechanism of some of the commoner reagents used in flotation. So far as is known, little or no work of a similar character has been applied to ascertaining the effect of sulphidising or other treatment of the various pure oxidised minerals.

The extent to which difficulties are encountered in the treatment of oxidised ores is reflected by mineral loss in the final tailing. It is logical to investigate this product thoroughly in order to ascertain the form of the lost mineral, and also whether the mineral loss is due to a coating of foreign material, such as iron oxide and clay, or of some product of the mineral itself that isolates the valuable material from contact with the reagents. Also when any reagents are added that seem to be promising for chemical reasons, a good idea may be obtained from close study as to why they do or do not function as expected. For instance, in the filming of a mineral, it may be learned whether the film does not form or whether it does not adhere after it is formed. Reasoning from chemical or physical hypotheses may indicate the proper procedure to obtain a sufficiently stable film to enable the mineral to float. Further information on these and other points is given in Serial 2811, *The Flotation of Oxidised Ores*, copies of which may be obtained from the United States Bureau of Mines, Department of Commerce, Washington, D.C.

Limestone for Metallurgical Purposes

ENORMOUS quantities of limestone are used for metallurgical purposes. The figures for this country cannot be stated exactly, but, in the United States, approximately 23,000,000 tons are used annually, chiefly for smelting iron ores in blast furnaces. Smaller amounts are used in basic open-hearth steel manufacture, and in smelting lead, copper, and antimony ores. Limestone producers are not always fully aware of the way in which their stone is used in metallurgy. Maximum tolerances of silica, alumina, sulphur, and possibly magnesium and the minimum content of calcium carbonate may be arbitrarily fixed for the guidance of the producer, but apart from these requirements little

information is available to producers on the manner in which their stone is used, the office it performs in smelting, or the effects of impurities. More complete knowledge of utilisation would enable limestone operators to solve their production problems better. On the other hand, the metallurgist's knowledge of conditions governing limestone production is also, as a rule, limited. Wider information on the origin, occurrence, and physical character of limestones, on quarrying processes, and on methods of separation from impurities would be of undoubted advantage to the furnace operator. In order that the problems of the limestone producer and the metallurgist may be co-ordinated, the U.S.A. Bureau of Mines has made a special study of the subject.

Most iron ores carry silica and alumina as impurities, and the addition of a basic flux, such as limestone, is necessary to form a slag with them. Lime is infusible at the temperature of a blast furnace, but when it combines with the silica and alumina of the ore and the ash of the coke it forms a liquid slag which floats on the molten iron. Thus the molten iron, freed in large measure of these impurities, is tapped off from beneath, while the slag is drawn off separately and removed to the slag dump. Another purpose of the flux is to remove the sulphur from the charge, for this element is a serious impurity in iron and steel. The majority of blast furnaces employ about 900 pounds of flux for each long ton of pig iron produced. The amount of flux required varies with the amount and nature of the impurities in the ore and in the stone itself. The foreign elements in fluxing stone are usually the same as those in the ore for the removal of which the flux is added, namely, silica and alumina. Impurities in the limestone are doubly detrimental; their presence reduces the percentage of lime and magnesia in the stone, and they require a certain share of the lime and magnesia to flux them off, as the flux must neutralise its own impurities as well as those of the ore. The cost of stone, delivered at the furnace, commonly has a direct bearing on the quality of stone used. The use of an impure stone may be justified only where it has the advantage of close proximity to the furnace, thus eliminating the usually heavy item of transportation expense. Fluxing stone is used in a great variety of sizes. At some furnaces the crusher run is used directly without screening. Usually the fines below ½ in. are taken out.

The problems connected with the quarrying of fluxing stone are similar in many respects to those encountered in other branches of the limestone industry. There are, however, certain noteworthy differences. For Portland cement manufacture about one ton of clay or shale is added to each three tons of limestone; therefore, the presence of clay with the limestone may be no detriment, but for fluxing purposes the clay content must be kept as low as possible. The raw materials, again, for cement manufacture, are finely pulverised, whereas fluxing stone must be in lump form. The crushed-stone industry has one feature in common with flux production in that fines are undesirable, but here the similarity ends. For crushed stone, physical properties, such as hardness, toughness, and porosity, are of greater importance than chemical composition, but for flux the chemical composition is of primary importance. Metallurgical limestone quarrying is most nearly related to quarrying for lime manufacture, for in both these industries stone of approximately the same chemical purity is demanded.

The chief impurities in fluxing limestone are silica and alumina, with smaller percentages of sulphur and phosphorus. The presence of a small amount of iron is not generally regarded as injurious. While iron in oxide form is not detrimental, its presence in sulphide form, as pyrites or marcasite, is undesirable on account of the sulphur associated with it. The impurities in fluxing stone are of two types—the sulphur and phosphorus which are injurious to the finished product, and the silica and alumina which, though they may have some influence on the quality of the finished metal, are for the most part simply diluents or inactive impurities that are objectionable because they require flux for their removal. The whole subject is treated in a report on "Metallurgical Limestone" (Information Circular 6041), which readers of THE CHEMICAL AGE may obtain on application to the United States Bureau of Mines, Department of Commerce, Washington, D.C.

I.C.I. Labour Policy

AMONG the many purposes that Imperial Chemical Industries may serve, not the least important may be the standard it is aiming to set up in the right handling of labour. To the causes to which industrial unrest are usually attributed, may be added two that would in any case be sufficient to explain the trouble. The first is the wrong handling of the human material—the management of men in such a way as to affront their self-respect and destroy any pride in their work or office. The other is lack of confidence in the concern itself. In both respects the constituent units of Imperial Chemical Industries have an excellent record, and that this is to be jealously safeguarded is clear from Sir Alfred Mond's most recent statement. What is called a "Labour Policy" is now being formulated, based upon the principles of profit-sharing, works councils, welfare schemes, workers' shares, and co-operation in every possible direction. In particular, big as the combine is, it is the intention to extend the personal touch between all employees and those directing the concern. It all promises an excellent example to the directors of large scale industry, and indeed to all concerned in works management.

Books Received

PUMPS AND PUMPING MACHINERY, ILLUSTRATED CATALOGUE. Wolverhampton: Joseph Evans and Sons (Wolverhampton), Ltd.

ABRIDGED SCIENTIFIC PUBLICATIONS from the KODAK RESEARCH LABORATORIES. Vol. X, 1926. New York: Eastman Kodak Co.

The Calendar

Aug. 31–Sep. 7	British Association for the Advancement of Science: Annual Meeting.	Leeds.
Oct. 23–26	Marcelin Berthelot Centenary Celebrations.	Paris.

PRIME MINISTER'S MESSAGE TO BRITISH MANUFACTURERS

Addressed to Mr. F. C. Macaskie on the occasion of Manufacturers' Day at the Advertising Convention at Olympia, July 21, 1927

Those manufacturers who are assembled at Olympia to-day are wise in recognising that marketing is as important as production. The competition with us by manufacturers of other countries becomes stronger every day, and it is only by the most up-to-date methods of salesmanship that we can maintain and increase the volume of our trade. No effort to that end can be spared. May I suggest that you should consider the importance also of combined effort? I mean firstly that manufacturer should work hand-in-hand with manufacturer, in order the better to get their goods before the buyers of the world, and secondly the association of manufacturer with artist, so that the goods should be of the most attractive kind. An illustration of the first form of co-operation is the annual British Industries Fair. It is an effort that deserves, and has secured, success. The larger the Fair the larger the number of buyers who are attracted to it. This year an unusually large number of applications for space is coming in, and increased space has had to be provided. The second form of combined effort is demonstrated by the interesting and suggestive exhibit, organised by the Department of Overseas Trade for the Empire Marketing Board, displayed in the building in which you are at this moment assembled.

In conclusion, may I wish success to your deliberations, for they are of such far-reaching importance to our national trade?

Stanley Baldwin

Collective Effort in Export Markets

By Sir Alfred Mond, M.P.

(Chairman of Imperial Chemical Industries, Ltd.)

In considering the development of trade in our overseas markets and especially in Empire markets, the problem is—how far, by operating not individually but collectively, better methods of advertising and propaganda can be employed, greater mass impression be produced, and a more extensive organisation created and utilised?

We all recognise to-day the value of "atmosphere" in creating a favourable field in which to operate and this is especially the case in our Dominions and Colonies. I have found in more than one direction, in my own experience, a genuine desire in our Dominions, not only to trade with the mother country, but to buy British goods in preference to goods of other countries, even if the terms are not quite level. I have also found complaints of the difficulties of obtaining information about goods, the adaptation of goods to local needs, and of insufficient inquiry into the use and customs of the people in their particular areas. When I was last in Canada, I was told, for instance, that a traveller for one of the celebrated firms of glassware merchants had been offering cut glass champagne glasses to the farmers of the Western Provinces, apparently quite regardless of the fact that they neither had the champagne, nor anywhere to put glasses of that kind, nor anybody to look after them.

The Policy of Collective Effort

Collective efforts which would bring with them an organisation of intelligence officers to study the problems of the markets and to act as *liaison* agents between the requirements of all the various markets and the manufactures at home, could undoubtedly be of very considerable use. Further, collective effort could present a picture of British industry and British development. British representation in the local press and British advertising would, I believe, have a very marked effect.

I cannot claim to have given a very great deal of personal attention to the art of advertising, our goods being so good that they are sold without it. I will not venture, therefore, to elaborate an advertising scheme framed on these lines, but I have no doubt that eminent advertising firms could work out such a scheme very successfully.

Collective effort cannot, of course, replace individual effort and cannot be confused with it. The specialist in a particular line, if he wishes to push, will still have to do his work. I will not bind myself to the idea that it is possible to leave to a general mission the actual work of either organising the sales of special products in the country, and still less that of undertaking to sell them. What collective effort can do is to create a framework in which the individual firm can work more efficiently and more cheaply, and to create an organisation of a more general character that can be used by all. A great deal, of course, must depend upon the size of the companies who are operating. This is one of the advantages of large units and amalgamations, as they can create selling organisations for markets such as I have spoken of and, indeed, for all markets. They have their collective effort directed and policy outlined by one set of chiefs.

The Brunner-Mond Organisation

Brunner Mond and Co. created such an organisation by means of subsidiary companies all over the main parts of the Empire, the Far Eastern markets, and South America. Such organisations by handling the products of the company and of subsidiary companies and allied products, as well as by becoming agents for other British firms, have been able to develop the use of British chemical products in a manner in which no other method could have been equally successful. The organisation created, staffed by men of first-rate rank and first-rate assistants, with all the necessary office and warehouse accommodation, machinery, technical help, and propaganda, enabled trade not merely to be continued but to be developed. By the formation of Imperial Chemical Industries, Ltd., this policy is being rapidly extended.

The wider the range of products, the better the opportunities and the scope of those engaged in the selling, distribution, and pushing of our business. For those whose units are not sufficiently large, collective efforts such as those made by the tinplate industry recently in creating a selling organisation for the industry would undoubtedly prove of the greatest advantage by joint marketing, joint propaganda, and joint co-operation generally in pushing the products of British industry.

The New Imperial View-point

I have been advocating a new view-point regarding our whole economic position. This is the day of large ideas and large units both in countries and in businesses. We are too apt to regard ourselves merely from a British standpoint. I feel certain we have to begin to view things from an Imperial standpoint. Whereas Britain as an economic unit is important, it is small as compared with the great economic units of the United States and the Continent of Europe. The British Empire is the largest economic unit in the world to-day. If we adopt the standpoint of treating it as such, of formulating our ideas on this basis, we have before us potentialities, organisation of production, consumption and wealth unequalled in any former period of the world. Collective effort must be directed towards this end, and the more that can be done to interlock the produce and manufactures, and to interchange the flow of trade between ourselves and various parts of the Empire, and among various parts of the Empire themselves, the sooner we shall arrive at that increasing stage of prosperity which alone can raise the mass of our population to those higher standards of life which should be the aim of all who are anxious for the future stability and progress of their country.

Salesmanship and Advertising

By Viscount Leverhulme

I may liken the salesman to the infantry who go over the top to obtain orders, and advertising to the artillery which gives them support and makes their task easier. Haphazard advertising, in whatever volume, is of very little more use in business than haphazard artillery fire in warfare. Advertising and salesmanship must both be part of a carefully prepared plan, and amid the strenuous competition of to-day advertising must be not only of the quality and quantity required, but placed where it is required. To achieve this to perfection, the sales manager and the advertising manager must almost live in the same room.

Let this point not be forgotten; it is elementary education which has enabled the masses of the country to read the newspaper. It is the Press which has given to the industries of the country their greatest advertising medium, and it is the advertiser who has enabled newspapers to be produced and sold at a price which brings them within the reach of everyone. Education, the Press, and advertising represent therefore a great triple partnership.

Conditions of Demand and Distribution in Overseas Markets

By W. A. Cooke, B.Sc.

THERE is a story told of a manufacturer who tried hard to persuade various agents in Iquique to take up his line of mackintoshes. They were, in his opinion, the best goods of their kind and the price was right, so that he was unable to understand why none of the agents to whom he wrote even had the courtesy to answer his letters. One day he met a friend who was going to Northern Chile, and asked him if he could help in the matter. The friend's reply was illuminating. "Iquique is the most desiccated place on earth; they only get rain there about once in 20 years."

The Meaning of Business Research

It might seem self-evident that one should make some investigations before embarking on the perilous venture of overseas trade, though one could go further and say that a sound basis of solid facts is wanted, whatever kind of trade one is engaged in, but it is essential for the person who aims to use business research to be on his guard against mistaking opinions for facts.

Business research has been defined as the discovery and analysis of facts for the betterment of business. Pioneer work in America has been performed by Mr. J. George Frederick, by the Harvard University Bureau of Business Research, and others. In this country there exists the "Business Research and Management Association," of which I had the honour to be president for two years. The fundamental view of that Association is that business research is primarily concerned with the task of providing business management with the essential facts upon which to formulate plans and policies for the conservation and development of business prosperity.

Conditions of Demand

What are the "conditions of demand" that should be known about an overseas market? It is an axiom of the research-minded business man that the proper study of custom is the customer. One can only generalise as to the facts wanted about customers or potential customers in any given country, unless one knows what country and what commodities are referred to. These are, however, some of the possible lines of inquiry :—

1. What is the size of the population?
2. How many men, women and children?
3. What races, colour and religion?
4. What is the per capita wealth, and how is wealth distributed?
5. Is the population urban or rural, or how distributed between each?
6. What are the main occupations?
7. What are the climatic conditions?
8. What habits, prejudices and preferences are noticeable?
9. What are the standards of living?
10. What is the educational standard?
11. What commodities and services are used—*e.g.*, motor cars, telephones, food, drink, clothes?
12. What tendencies are at work in all these matters?

By discovering the answers to these and similar simple questions appropriate to the particular case, the merchant or manufacturer will be in a position to turn to his produce and cross-examine himself as to its suitability to the desired market.

What the Exporter Should Know

Some of the questions he could ask himself might be :—

1. Can the article be used there at all?
2. Is it at present used?
3. What modifications might be adopted?
4. What is the most suitable quality?
5. Is the price (after landing it in the country and paying all charges and tariffs) likely to be attractive?
6. Is the total possible demand likely to be such as to make it worth my while trying for that market?
7. What are the standards of weight, size, width, shape, or other property of the article that must be adopted?
8. What are the best colours, wrapping, packages, and other extrinsic qualities that are likely to appeal?
9. If my goods cover a large range or a big variety, at what point shall I be most likely to obtain the biggest return?

Having analysed the market on the one hand and examined the product on the other, there yet remains the distribution problem to be investigated.

A Suggested Questionnaire

A questionnaire drawn up on these lines would give valuable data :—

1. Are the requirements of the market well provided for by well entrenched suppliers, either native or foreign?
2. Is there any weak point in the competitor's product or position in the particular country—*e.g.*, is he farther away, is his price wrong or his goods not quite suited in any respect to the requirements as shown by market analysis?
3. Could his methods of distribution and salesmanship be improved upon?
4. What are the transportation facilities to and within the country?
5. Are the means of communication, telegraphs, post office, etc., developed?
6. What are the wholesale, retail, and agency outlets available?
7. Is it essential to carry local stocks, or will either retailer or wholesaler order far in advance?
8. What credit information is available?
9. What are the chief centres to work from?
10. What resistances are likely to operate along the lines of distribution—*e.g.*, tariffs, indifference of wholesalers or opposition of retailers?
11. What policy is most likely to encourage co-operation on the part of any distributive links—*e.g.*, price fixing, selling aids, advertising to consumers, appointment of sole agents, quantity discounts, long credits, etc.?
12. What form should the selling organisation take—*e.g.*, travellers' selling to buying offices in London, agents living in the foreign country, or special representatives sent from home, or a combination of these and other methods?

All of these and similar questions should be approached entirely from the consumer's point of view, so that any policy agreed upon shall as far as possible lead to the maximum of pull from his end for the commodity, thereby lessening the push that is needed from the producing end.

Essential Advertising

This brings me to the subject of advertising. Goods cannot be bought by people who have never heard of them, any more than they can be bought if they are not on the dealer's shelves. Any activity which brings the goods to the favourable notice of a possible customer is, therefore, a form of advertising.

I am only going to indicate a few of the questions that are appropriate to this part of the subject :—

1. What is the language preferred by the inhabitants?
2. What press or other media exist?
3. What are the relative merits of various media?
4. What appeals are likely to succeed?
5. What local peculiarities should be avoided or appealed to?
6. Can a market that is only potential be made an actual market at a cost that is not prohibitive?

The question can now be asked, "Where is all this information coming from?" Some of it does not exist and can only be obtained by personal effort. It is surprising, however, to find that more information exists than is used. A great deal can be got from books and official or semi-official journals.

A Co-operative Policy

I would seriously put forward the idea that in some industries, firms should combine to support co-operatively a comprehensive market survey in various parts of the world in order to find out how more of their own goods could be sold. Would not the manufacturers and merchants of Lancashire (who, to their credit, lavishly support the technical research work of the Cotton Industry Research Association) benefit possibly even more from an investigation of the conditions for the successful marketing of English cotton goods all the world over? The cost would probably be infinitesimal compared with the benefits to themselves. For the merit of research rightly applied is that it benefits everyone—producer and consumer, employer and employed.

Chemical Markets in the Empire

Sources of Supply and Trade Conditions

In the following survey of the chemical industry in the Empire some indication is given of the needs of markets in the colonies, together with notes on existing sources of supply, and on some of the complaints made with regard to supplies from other sources. A point worthy of interest is the entry of Belgium into the fertiliser markets in many directions.

Exports from the United Kingdom

It is encouraging to see from the Board of Trade returns that for the six months of this year ended June 30, the value of the exports of chemicals, drugs, dyes, and colours shows an increase of £25,544 over the corresponding period last year, although the figure is still short of the value for 1925. The figures for the three years are: 1925, £12,358,100; 1926, £11,504,023; 1927, £11,529,567. Coal tar products have decreased in value from £1,105,134 in 1926 to £1,063,106 in 1927. The 1925 figure was £890,067. In the acids and ammonium compounds group it is worth noting that although the value for the six months of £1,239,499 is below both the preceding years, the exports for June this year are approximately £110,000 above 1925 and £212,918 above last year. Potassium compounds at £133,015 show an increase over both the preceding years, as also do the sodium compounds of which £2,026,564 worth were exported. The total value of chemicals and products other than drugs and dyes shows an increase from £7,663,361 in 1926 to £7,778,511 this year, but is short by £609,563 of the 1925 figure. Drugs have fallen off to £1,403,269, but dyestuffs show an increase on both years at £1,992,487 compared with £1,900,401 in 1925 and £1,894,706 last year, although in June this year there was a decrease of about £19,000.

Below are given the values of export for the first six months of 1925, 1926, 1927.

Exports Value.

	Six months ended June 30.		
Chemical Manufactures and Products—	1925	1926	1927
	£	£	£
Acids—			
Sulphuric	16,560	34,017	13,964
Tartaric	26,574	31,385	47,997
Ammonium Compounds—			
Chloride (Muriate)	46,257	49,435	45,317
Sulphate—			
To France	46,324	13	—
,, Spain and Canaries	806,373	295,211	465,314
,, Italy	101,354	25,196	26,838
,, Dutch East Indies	206,310	221,108	29,698
,, Japan	235,655	350,665	379,243
,, British West India Islands and British Guiana	82,293	39,725	27,898
,, Other Countries	267,785	355,642	310,508
Total	1,746,094	1,287,560	1,239,499
Bleaching Powder (Chloride of Lime)	95,414	88,110	100,819
Coal Tar Products—			
Anthracene	5,662	3,225	814
Benzol and Toluol	13,363	37,235	4,241
Carbolic Acid	107,017	104,346	125,147
Naphtha	2,455	4,770	2,148
Naphthalene	7,310	5,607	4,013
Tar Oil, Creosote Oil, etc.	620,771	828,895	720,091
Other Sorts	133,489	121,056	206,652
Total	890,067	1,105,134	1,063,106
Copper, Sulphate of	776,851	676,934	664,682
Disinfectants, etc.	491,095	469,537	487,367
Glycerine	367,048	371,748	339,415
Potassium Compounds—			
Chromate and Bichromate	24,696	15,912	29,717
Nitrate (Saltpetre)	11,524	15,141	16,061
All other Sorts	78,404	69,973	87,237
Total	114,624	101,026	133,015
Sodium Compounds—			
Carbonate	821,849	723,239	847,956
Caustic	647,958	683,387	792,878
Chromate and Bichromate	39,974	26,149	18,898
Sulphate	61,146	52,635	44,464
All other Sorts	406,786	346,204	322,368
Total	1,977,713	1,831,614	2,026,564
Zinc Oxide	37,209	35,874	18,421
All other Sorts	1,802,568	1,580,987	1,598,345
Total of Chemical Manufactures and Products (other than Drugs and Dyestuffs)	8,388,074	7,663,361	7,778,511
Drugs, Medicines and Medicinal Preparations—			
Quinine and Quinine Salts	108,556	93,428	95,094
All other Sorts	1,429,179	1,456,530	1,308,175
Total	1,537,735	1,549,958	1,403,269
Dyes and Dyestuffs—			
Products of Coal Tar	495,169	353,533	309,010
Other Sorts	36,721	42,465	46,290
Total	531,890	395,998	355,300
Painters' Colours and Materials—			
Barytes, ground, and Blanc Fixe	14,173	11,085	4,570
White Lead (dry)	136,430	75,881	49,962
Paints and Colours, in paste form	591,133	634,785	659,395
Paints and Enamels Prepared (including Ready Mixed)	589,355	577,186	656,017
All other Sorts	569,310	595,769	622,543
Total	1,900,401	1,894,706	1,992,487
Total of Chemicals, Drugs, Dyes and Colours	12,358,100	11,504,023	11,529,567

The New Zealand Market

The latest annual report for New Zealand states that the increasing imports of German dyes is said to be due to the lower prices of these dyestuffs and to superior dyeing qualities, together with distinctiveness of shades. In the piece dyeing of woollens German dyes are alleged to give better penetration and, on the whole, a more level result.

The proportion of trade held by the United Kingdom in the supply of basic slag and phosphates is decreasing and this appears to be due in part to the difficulty of securing supplies with a high phosphoric acid content and in part to a varying acid content. The most interesting feature is the entry of Belgium as a competitor in the fertiliser market.

Before the war practically all the explosives used in New Zealand were imported from the United Kingdom, but supplies are now practically all drawn from Australia. This change of supply is seemingly due to the operation of branch factories in the Commonwealth.

Below are given statistics for 1914 and two post-war years (the latest available), together with the percentage of trade held by various countries :—

Dyes, Manufactured (1914 Figures Include Crude.)

		Percentage of Trade.			
Year.	Value.	U.K.	U.S.	Australia	Germany	Other countries
1914	£15,190	31·5	6·3	6	50·5	—
1923	£66,029	66·8	11·7	4·9	5·7	—
1925	£39,567	56·0	8·9	11·9	18·9	—

Basic Slag and Thomas Phosphate.

						Belgium
1914	£119,940	56·0	—	0·2	4·0	2·2
1923	£113,275	25·3	5·9	—	—	64·9
1925	£138,777	36·9	—	—	0·6	62·2

Explosives.

1914	£901	97	—	3	—	—
1923	£23,379	35·7	8·6	55·7	—	—
1925	£27,859	2·6	—	97·4	—	—

In the fine chemical trade the competition from Germany is severe, but the United Kingdom is gradually gaining a place.

India and Ceylon

In Ceylon a great increase has taken place in the consumption of artificial and other fertilisers, which are attracting much attention owing to the interest taken in their use by agricultural research stations. In 1926 the value of imported fertilisers amounted to more than Rs. 11·8 million, a considerable increase on the previous year. In the nitrogen group 8,744 tons of ammonium sulphate were imported, chiefly from India and France, as against 6,676 tons the previous year. Nitrate of soda increased from 2,607 to 5,288 tons last year, two-thirds coming from Chile and the remainder from Belgium and Germany. Calcium cyanamide was used to the extent of 2,363 tons, against 1,440 tons in 1925, Italy providing the greatest proportion. Potash fertilisers (especially the high grade products) play an important part in Ceylon, chloride being chiefly used. Imports of this in 1926 amounted to 7,639 tons, of which 5,806 came from Germany and 1,818 tons from France; and about 1,351 tons of sulphate, chiefly from Germany, were used.

Sylvinit and Kainit were in little demand, and consumption declined by 30 per cent. Although phosphates are not used as much as they might be, consumption is increasing, 5,020 tons being imported in 1926, an increase of 1,259 tons on the previous year. Belgium and Holland supplied practically the whole of the demand, the former sending the larger amount, 3,211 tons against 1,465 from the latter country. Basic slag was supplied by Belgium. A large amount of fertilisers is supplied by India, which sent 16,870 tons of bone meal and about two-thirds of the 14,380 tons of fish guano that were used.

In the case of India the United Kingdom holds a large proportion of the trade in chemicals (fine and heavy) and chemical preparations, but Germany is gradually extending her markets, as also is Italy. With regard to fine chemicals, the price is the important consideration with the Indian consumer, who will not demur at being sold a product of inferior quality provided it is low in price.

Fertilisers in India

The Director of Agriculture of Bihar and Orissa, in a report published recently, states that the most important development in the last five years has been in connection with artificial fertilisers. Artificial fertilisers have been demonstrated to give excellent results in Bihar, where it is said there is a deficiency of phosphate in the soil. On account of its proved effect on vegetables and sugar cane ammonium sulphate is in increasing demand, and the Government has sanctioned a subsidy to certain banks for the employment of staff to supervise the supply of fertilisers to members of co-operative societies. A campaign of propaganda being organised by a Calcutta firm for the popularisation and distribution of their products is likely to be followed by important results if the purity of the fertilisers is maintained.

The total consumption of ammonium sulphate in India and Ceylon during 1925-26 amounted to 23,000 tons compared with 13,000 in the previous year. Nearly all local production, and 12,000 tons from the United Kingdom, were needed to supply the demand, which seems as though it will expand still more.

South Africa

South Africa is becoming an increasingly difficult market for British chemical products owing to the growing popular Boer element. British makers of fine chemicals especially are finding that although their products may be superior to those of foreign manufacture, preference is given in many cases to German, Dutch, or other foreign articles, owing to the anti-British sentiment which is spreading among many teachers and chemists in laboratories in the Union. This feeling is also prevalent, it is stated, to some extent in India.

The Position in East Africa

The following figures for 1924, the latest available, give some idea as to the sources upon which British East Africa depends for chemicals, paints, varnishes, etc. In Kenya Colony and Uganda the value of imports was £56,737 of which 77 per cent. came from the United Kingdom; Tanganyika Territory imported £26,331 worth of chemicals of which 62 per cent. came from the United Kingdom and 8 per cent. from Germany; and imports into Zanzibar amounted to £22,121 of which 70 per cent. came from the United Kingdom and 10 per cent. from Germany. Kenya Colony being composed of virgin soil, is not at present in need of a great amount of fertilisers.

Recent Developments in Canada

The use of electricity, at first only applied to copper refining, is now being extended to all metals and is also being used in the extraction of metals from ores. The production of aluminium, cyanamide, and new refractory materials has created large new industries in Canada, such as the manufacture of nitric acid, ammonium nitrate, and explosives, while the production of innumerable compounds are now in course of development. Progress has been made in the manufacture of calcium carbide, which can be marketed in countries dependent for their domestic manufactures upon electrical energy derived from coal. In 1926 $1,566,407 worth of material were exported, chiefly to the United States. The value of chemicals manufactured with the aid of electrical energy in 1925 was $114,831,000.

Chemical Trade in the Irish Free State

The greater bulk of the Irish trade in chemical and allied products comprise imports which show an upward tendency. The value of chemicals, dyestuffs, colours, and perfumery chemicals advanced from £937,651 in 1924 to £1,128,970 in 1926. It is difficult to make comparisons in the export and re-exports owing to the inclusion of oil, fats, soaps, etc., but exports of this greater number of products rose in value from £82,054 in 1924, to £84,277 in 1925, and fell last year to £75,825. Re-exports are unchanged at about £45,000.

With regard to fertilisers last year shows a recovery upon the decline in imports in 1925, the values being £608,485 against £570,489. The share of Great Britain and Northern Ireland has continuously lessened. The value of fertilisers exported from Great Britain fell from £209,292 in 1925 to £143,148 in 1926, which was due in part to reduction in price and partly to a smaller volume of trade, more particularly in superphosphates and ammonium sulphate. In the phosphate group, phosphate rock imports have recovered after falling to 42,414 tons in 1925, and last year rose to 56,750 tons. Most of the imports come from Algeria, Tunis, and Morocco, in 1925 the percentage of trade being 64, 25, and 11 respectively. Superphosphates declined from 56,487 tons in 1924 to 44,735 tons last year. The most remarkable point about the superphosphates is the fall of Great Britain as a supplier, for imports from this country last year were less than half those in 1924. Northern Ireland has not suffered nearly such a severe decline. The most important supplier to-day is Belgium, which has advanced more than 60 per cent. on the 1925 figure, to 13,624 tons. Supplies from Holland have declined and those from France remain steady.

Belgium again supplies most of the basic slag to the Free State, while Great Britain, France, and Holland follow on. Among the nitrogen fertilisers ammonium sulphate is most widely used and is growing in popularity at the expense of sodium nitrate. Until last year the demand for ammonium sulphate was met by Great Britain and by Northern Ireland, but last year the scarcity of material in this country consequent on the coal strike resulted in a falling-off of about one-third of the total, while Northern Ireland gained a certain proportion, and the United States supplied the remainder. It is noteworthy that the demand was satisfied by America and not Germany.

Potash is chiefly supplied by Germany. Nitrate of soda is now supplied from a different source, for whereas the greater amount of the material formerly came from Great Britain, this country has been supplanted by Belgium, while there is an increasing desire to buy direct from Chile.

Future of the Engineers' Club

At a special meeting of members of the Engineers' Club, Coventry Street, London, on Thursday, July 21, it was unanimously resolved, in view of statements by the Chairman, "that this meeting has every confidence in the present committee and management of the Club and pledges itself wholeheartedly to assist the committee over the present difficult position," and "that all who have subscribed to the voluntary fund shall be requested to release the Chairman from his undertaking as to the minimum subscription, and that all members who have not already subscribed be requested so to do, and that such sums as have been, or will be, subscribed be used on the consent of members so subscribing being obtained."

Indian Chemical Notes

(FROM OUR INDIAN CORRESPONDENT.)

Manufacture of Sulphuric Acid

THE Dharamsi Morarji Chemical Co., in a statement to the Royal Agricultural Commission of India, says the total productive capacities of sulphuric acid plants in India is about 70,000 lb. The following are the manufacturers' names with the productive capacity of their plants :—

NAMES OF MANUFACTURERS.	Tons.
Bengal :	
D. Waldie and Co., Konnagar	7,713
Bengal Chemical and Pharmaceutical Works, Calcutta	2,941
Behar and Orissa :	
Bengal Coal Co.	3,220
Tata Iron and Steel Co.	7,777
E. I. Railway, Giridih	2,563
Behari Coke Co., Jamadoba	1,126
Barari Sulphuric Acid Plant	1,103
Jheri Sulphuric Acid Plant, Lodna	313
Burma :	
Burma Chemical Co.	15,704
Bombay :	
Eastern Chemical Co.	8,994
Dharamsi Morarji Chemical Co.	10,000
Madras :	
Parry and Co.	3,332
Cordite Factory	1,481
Punjab :	
Small Factories	449
United Provinces :	
D. Waldie and Co.	2,905
Sulphuric Acid Manufacturing Co., Ghaziabad	245
Total	69,866

Phosphatic Deposits

Phosphatic rocks of fairly high percentages of calcium phosphates exist in various parts of India. The following is the up-to-date list of available sources of supply :—(1) At Singhbhum (Bengal) a deposit already opened up contains an estimated reserve of 1,500,000 tons, the percentage content of phosphoric acid being as high as 55 to 60 ; (2) Deposits have been found in the Trichinopoly district of Madras. Though the content and the available quantity of the mineral have not yet been determined, the fields promise to prove very valuable, inasmuch as the mineral is said to contain 56 to 59 per cent. of phosphoric acid ; (3) Abandoned Mica mines in the Hazaribag district contain phosphates of a useful quality ; (4) Rewakantha (Bombay) and Jothawad (Narukot State) have deposits " which can be exploited profitably," says Sir Thomas Holland ; (5) In Jhelum district (Punjab) and Dongarpur State (Rajputana), rocks have been found ; (6) In Mussoorie a find of valuable material containing about 76 per cent. of phosphoric acid has been discovered, lying along with the lime beds.

Export Duty on Manures

In view of the large exports of natural manures from India, which necessarily leave the Indian soil impoverished, the Dharamsi Morarji Chemical Co. have asked, in their evidence before the Agricultural Commission, for drastic measures to stop this outflow of fertilisers. They propose that in the case of bones, oil cakes, and fish guano, the export should be altogether stopped by prohibitive legislation or by raising an insurmountable tariff wall. In the case of oil seeds duties should be levied on the export of seeds, and bounties should be given out of the proceeds of these duties to the manufacture and export of oil to counterbalance the high tariff duties placed by European countries against the imports of oils.

Research in Magnetism

Professor C. V. Raman, of Calcutta University, has developed a new and extremely sensitive apparatus by which the feebly magnetic properties of gases and vapours may be accurately measured. By the help of this apparatus it has been demonstrated that the rare gases of the argon type are actually repelled by a magnet. The measurements made with the apparatus suggests that in certain cases there is noticeable increase in the strength of the magnetic properties of a molecule when it passes from the condition of liquid to that of vapour. A large and very powerful electro-magnet has also been specially constructed for researches in molecular magnetism, and with its aid and with auxiliary optical apparatus it is possible to demonstrate in a visible manner that the molecules of a liquid when placed in a strong magnetic field tend to turn round and arrange themselves parallel to one another. The effect is very strong in some liquids, but is relatively very weak in others, such as water, ether, or alcohol.

Artificial Silk

A well-supported demand has arisen in India for the total abolition of the import duty on artificial silk. The Bombay Chamber of Commerce, voicing the public opinion on this question, has addressed the Government of India on the matter making a strong case for abolition. The demand for artificial silk in India in mills and on handlooms is rapidly increasing. The total imports in 1926–27 were valued at Rs. 421 lakhs, as against Rs. 218 lakhs in the previous year. The imports of yarn increased from 2·6 to 5·7 million lb., about four million lb. of these coming from Italy. In piece-goods mixed with cotton, the total imports increased from 15 to 42 million yards, the British share increasing from 6½ to 16 million yards, and the Italian share from 5 to 14 million yards.

Sleepers for Railways

Mr. Wilson, the Forest Economist at the Dehra research institute, states in a bulletin, as a result of his experiments, that as wooden sleepers have now proved to be more economical than metal sleepers, the latter will not have a great future in India unless it becomes possible to reduce their price considerably. The experiments undertaken at the Institute have shown that a great number of the lesser known timbers are suitable for sleepers if correctly treated, and the supplies of these miscellaneous timbers will not run short, as many of them exist over vast areas of virgin forest. Some experimentally treated sleepers which have been actually laid in various railway lines for some years past have proved beyond doubt the " economic value " of these sleepers to be by no means inferior to teak, sal or deodar sleeper, or steel or cast iron sleepers.

Bhadravati Iron Works

According to the Dewan of Mysore State, the operations of the Bhadravati Iron Works have shown marked improvement during the current year in every direction. For the next year the anticipated surplus will be Rs. 3½ lakhs. The board of management have under their consideration a number of schemes for removing inequalities in the present plant and for building up a few allied industries. It is proposed to make a provision of Rs. 15 lakhs for capital expenditure during the ensuing year.

Road Oils, Ltd.

A new company, known as the Road Oils, Ltd., has been registered in India, with an authorised capital of Rs. 10 lakhs, for the purpose of manufacturing and selling " Mexaco " road oil. The business has been purchased from the vendor company, whose " Mexaco " product has been found very satisfactory and economical for the efficient repair and upkeep of roads in India. The cost of the manufacture of " Mexaco " has been comparatively small, enabling it to be sold at the low price of 13 annas per gallon, which shows a very appreciable profit. The new company will instal ten units so as to provide for an output of 6,000 gallons per day.

Industrial Companies

The new companies registered in India during 1926–27 connected with chemical industries numbered 15, with a total capital of Rs. 30 lakhs. There were also four companies registered connected with tanneries and leather trade, with a capital of Rs. 10 lakhs, and eight companies for cement and lime with a total capital of Rs. 37 lakhs. Other important companies formed include the Punjab Paper and Pulp Mills Co., Ltd., with a capital of Rs. 50 lakhs.

Mining Education in Burma

The directors of the Burma Oil Co. have donated £100,000 to the Rangoon University for establishing a college of mining and engineering. It may be mentioned here that, though Burma is an important mining province, there is no provision as yet in the province for technical training in mining knowledge. The new donation would give a strong impetus to the mining industry by making it possible for trained hands to be available locally.

S. G. W.

Chemicals and Allied Products in Canada

A Review of Dominion Trade

The annual review of trade in chemicals and allied products in Canada in 1925 (published by the Dominion Bureau of Statistics) covers this field in the most comprehensive way and contains tables of great interest. We publish below the substance of the general summary, prepared by Mr. S. J. Cook, chief of the Mining, Metallurgical, and Chemical Branch.

CHEMICAI processes contribute not less than one-fifth to the aggregate value of Canadian manufactures each year. In 1925, the latest year for which complete data are at hand, 1,400 concerns using chemical processes made products valued at $655,000,000; the aggregate value of all manufactured products in that year was $2,678,000,000. Employment in these industries totalled close to 87,000 persons, and salaries and wages to almost $110,000,000.

Twenty-eight industries have been selected as typical. These are the leading enterprises in Canada depending on the applications of chemical science for the manufacture of their major products, but they are by no means all the industries in which chemistry finds a place in Canadian productive enterprise. For instance, there have not been included in this grouping those great extractive plants in which ores are processed for the recovery and refining of a variety of metals; only those concerns commonly thought of as engaged in manufacturing have been considered here.

Production of chemicals and allied products in Canada showed substantial progress in 1925. The 510 plants reporting in that year manufactured commodities with a total selling value of $112,906,746, an increase of 4·7 million dollars over the reported value of sales in the preceding year. The output value of paints, pigments, and varnishes was 2 million dollars above the corresponding total for 1924; the manufacture of heavy chemicals, soaps, washing compounds and toilet preparations showed gains of over a million dollars; the medicinal and pharmaceutical preparations industry, the manufacture of inks, dyes and colours, the fertilisers group and the numerous small plants producing miscellaneous chemical products, showed substantial increases over the preceding year; the output of coal tar and disinfectants was well maintained; while the explosives, ammunition, fireworks, and matches industry and the wood distillates industry showed declines from 1924. Employing 13,951 persons to whom 17·5 million dollars were paid in salaries and wages, the 510 plants reporting in these industries in 1925 represented a capital investment of 126·5 million dollars and used materials costing 56·3 million dollars in the production of commodities having a selling value of 112·9 million dollars. The value added by manufacture thus amounted to 56·6 million dollars.

Throughout 1925, prices of chemical products showed a slightly downward trend. Based on 1913 prices as 100, the Bureau of Statistics' index number on chemicals and allied products, which showed an average of 161·8 in 1924, declined to an average for the year of 157·1, with only slight variations from month to month. That is to say, while a given quantity of the 13 chemical products listed in the index, cost $100 in 1913, the cost of an equal quantity of the same chemicals in 1925 was $157.10 as against a cost of $161.80 in 1924.

By industries, the acids, alkalis, salts, and compressed gases group led the list with a total production value of $27,483,395, followed by paints, pigments, and varnishes worth $22,234,268; soaps, washing compounds, and toilet preparations, an output value of $17,388,506; medicinal and pharmaceutical preparations, valued at $13,987,849; explosives, ammunition, fireworks, and matches worth $12,313,155; and the miscellaneous chemical industries group with products valued at $10,699,162. Output values of the inks, dyes and colours industry, and of the coal tar products, each exceeded 2·5 million dollars; wood distillates and extracts totalled nearly 2 million dollars in value, and the output of fertilisers was above the million dollar mark.

The total capital employed in the chemicals and allied products group remained at about the same figures as in the preceding year and amounted in all to $126,483,348, of which approximately one-half was invested in lands, buildings, machinery and tools, and the remainder was almost equally divided between the cost of materials, stocks in process, etc., and working capital.

The trend of employment as reflected by the records of the number of wage-earners on the rolls as at the fifteenth of each month showed 9,753 wage-earners (excluding salaried employees) on the rolls in January, from which the number employed increased gradually to the maximum of 10,300 in May and thereafter remained fairly steady to make an average of 10,122 for the year.

In Canada's foreign trade there were substantial gains in both the imports and the exports of chemicals. Increases in imports were general throughout the list, but were particularly noticeable in the items of cellulose products; medicinal and pharmaceutical preparations; dyeing, and tanning materials; fertilisers; paints and varnishes; and unspecified chemicals. Total imports of chemicals and allied products for the year were valued at $27,653,819 as compared with a total of $24,565,574 in 1924. In the export field there were important gains in the fertiliser and heavy chemical groups, and appreciable gains were made in the exports of soap.

Not since 1919, when some war-time output was still being shipped, has Canada shown a favourable balance of trade in chemicals and allied products. In 1925, the excess of imports over exports amounted to 10·2 million dollars, a gain of 1·1 million dollars over the figures for the preceding year. While Canada imported chemicals and allied products to a value of 27·6 million dollars, exports were valued at only 17·4 million dollars.

An analysis of the trend of Canada's external trade in chemical products shows that the value of imports in this class from the United States made up 66 per cent. of the total brought in from all foreign sources; 16 per cent. of the value of purchases, represented goods from the United Kingdom, and the balance, or 18 per cent., was derived from other countries, chief among which were Germany, France, Netherlands, Chile, Belgium, Switzerland, and the Argentine.

In the export field, electrochemical products led the list. Sodium cyanide, cyanamide, and calcium carbide were the three largest items in the group, and the export of acetic acid, much of which is produced from carbide, has also increased in recent years. Canada's other chemical exports of importance include soda ash, cobalt oxides and salts, ammonium sulphate, paints, pigments, and varnishes, medicinal and pharmaceutical preparations, soaps (more particularly toilet soaps), and sulphuric acid.

Coal Tar and its Products

This industrial group includes all those firms whose principal products were obtained by the distillation of crude coal tar, or by the manufacture of commodities, such as disinfectants, from the distillation products. In 1925, production values totalled $2,622,821, as compared with $2,637,577 in 1924. Of the 15 plants in this group, 9 were primarily tar-distilling units and 6 were engaged in the manufacture of disinfectants.

The 9 tar-distilling units were located as follows: 4 in Ontario, 2 in Quebec, and 1 in each of the provinces of Nova Scotia, Manitoba, and British Columbia; 1 new plant in Ontario was opened during the year. Capital employed at $3,101,951 was 6 per cent. above the 1924 figure, but production was slightly lower at $2,502,629. Raw materials worth $1,365,314, consisting essentially of crude tar, yielded over 2 million gallons of creosote and special oils, 21,350 tons o' pitch, 7 million gallons of tar and nearly 1 million dollarsf worth of other products.

The disinfectant industry showed a slight improvement in 1925. Capital invested stood at $179,381, as against $173,698 in 1924, and production amounted in value to $120,192, as compared with $118,084 in the previous year. The 6 plants were distributed as follows: 4 in Ontario, and 2 in Quebec.

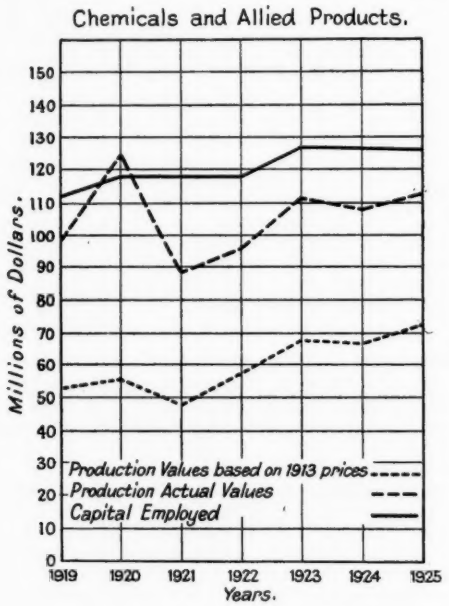
Acids, Alkalis, Salts, and Compressed Gases

Production of industrial chemicals other than coal tar products, including such heavy chemicals as sulphuric, nitric and hydrochloric acids, caustic soda, salt cake and calcium carbide, and compressed gases such as oxygen, hydrogen, ammonia

and acetylene dissolved in acetone, has been reviewed as one industrial group, but owing to the fact that the manufacture of compressed gases differs appreciably from the manufacture of heavy chemicals the group has been reviewed under two sections: acids, alkalis and salts; compressed gases.

For the group as a whole, the value of production was higher by more than a million dollars than the total for the previous year, and the capital employed increased by a like amount. The average number of persons employed was 2,409, and payments of salaries and wages totalled $3,474,290. Ontario plants contributed $1,464,766 to the total value of the output, and production from the Quebec plants amounted to $4,953,172.

In 1925, there were 20 acids, alkalis, and salts plants in operation in this industry; the same number reported in 1924, but 1 of these plants did not operate during 1925, while a new plant in Ontario commenced to produce sulphuric acid from waste smelter gases. Capital employed showed an increase of 2 million dollars and the value of products was greater by 1·2 million dollars and amounted to $25,396,782. There was an increase in the production of hydrochloric and sulphuric acids, but calcium compounds including cyanamide and carbide showed a slight decline to $5,733,279. Sodium compounds including carbonate, cyanide, hydroxide, etc., were



valued at more than 5·5 million dollars. In this industry, more particularly than in most other industries, large quantities of intermediate products are made for the further use of reporting firms. Of the total production of 1925, which amounted in value to 25·4 million dollars, 8·5 million dollars represented the value of products used as materials in further processes. Lime, calcium carbide, and crude cyanamide made up the bulk of the intermediates.

Production of compressed gases was maintained at about the same level as in 1924, the total selling value being $2,086,613, as compared with $2,051,448 in the previous year. Oxygen, acetylene, and carbon dioxide were the principal products of this group; aqua and anhydrous ammonia, and nitrogen were produced in smaller amounts. Production of acetylene was 5 million cubic feet more than in 1924, while the output of oxygen and carbon dioxide showed a slight increase. This group includes all firms manufacturing oxygen, hydrogen, acetylene, carbon dioxide, and ammonia. Some firms who did not manufacture their own acetylene purchased the gas and compressed it in cylinders, in which form it was marketed. The manufacture of pure ammonia gas has been recorded in this group, but the production of ammonia liquor from gas plants is not included.

Explosives, Ammunition, Fireworks, and Matches

There were 15 firms classified in this group in 1925. Of these 7 were located in Quebec, 7 in Ontario, and 1 in British Columbia. Production values amounted to $12,313,155, or about a million dollars below the total for 1924. Employment likewise was a little below 1924, there being an average of 2,072 names on the rolls in 1925 as compared with 2,174 in the previous year.

Production of explosives in 1925 was valued at $7,999,856, and while this figure is half-a-million dollars below the output value of 1924, it is probable that the actual volume of output in 1925 was considerably above that for 1924. More dynamite was made than in 1924, but the output of gunpowder was only half of the amount produced in the previous year; other products showed little change. Among the intermediates made for use, nitric acid, nitro-glycerine, and recovered acids figured largely, reaching a total value of $2,287,515, as compared with a value of $5,312,341 for products made for sale.

The same 3 ammunition firms in Canada produced ammunition in 1925 as were produced in 1924; all were located in Quebec. Production value was slightly lower at $2,129,975, as compared with $2,936,960 in 1924.

The fireworks industry is very small. There were 3 plants operating in 1925, and the production was valued at $128,684, as compared with $196,672 in the previous year. The industry employed 33 persons throughout the year and paid $52,572 in salaries and wages. Manufactured fireworks made up the large part of the production.

The total production of the match industry amounted in value to $2,054,640, an increase of 23 per cent. over the total of $1,674,001 in 1924. Four plants were in operation, of which 2 were in Quebec and 2 in Ontario. The production value as reported above, was the selling value at the works, exclusive of the excise tax.

Fertilisers

The fertiliser industry includes only those plants engaged in the manufacture of complete fertilisers as a principal product. Mention has been made, however, of commodities such as cyanamide, ammonium sulphate, ground bone, etc., and similar fertilisers and fertiliser materials produced in other industries. In 1925, there were 13 plants in operation in this industry. Capital employed at $2,095,608 was slightly above the figure for 1924, and the average number of persons employed was 201, as compared with 166 in the previous year. Production also was above that of 1924; in 1925, the output was valued at $1,437,787, as compared with $1,277,145 in 1924. Complete fertilisers produced in this industry amounted to about 41,000 tons valued at $1,142,510, as compared with 30,000 tons produced in the previous year at a selling value of $1,086,806. Production of fertilisers in other industries was also greater than in 1924. The outputs of calcium cyanamide, animal tankage, ammonium sulphate, ground bone, and fish fertiliser were above the quantities made in the previous year.

Medicinal and Pharmaceutical Preparations

Further improvement was noted in the production of medicinal and pharmaceutical preparations in Canada during 1925. The total output was valued at $13,987,849, as compared with $13,350,347 in 1924. The industry continued to be centred largely in Ontario, where 77 plants produced patent and proprietary and other medicinal, pharmaceutical, and toilet preparations worth in the aggregate $9,223,383; Quebec's 30 plants produced $2,777,680 worth of such preparations. There were also 6 plants in this industry located in Manitoba, 2 in each of the provinces of Nova Scotia, New Brunswick, and British Columbia, and 1 in Saskatchewan. Patent and proprietary medicines and pharmaceutical preparations made up the bulk of the output.

Paints, Pigments, and Varnishes

In point of value of production the paints, pigments, and varnishes industry ranked next to the heavy chemical industry in 1925. The output of the paint industry was valued at $22,234,268, an increase of 2 million dollars over the total for 1924. There were 62 plants in operation in 1925 as against 55 in the previous year. Active plants were located as follows: 29 in Ontario; 17 in Quebec; 4 in Manitoba; 10 in British Columbia; and 1 each of the provinces of Nova

Scotia and Alberta. Quebec plants produced $9,217,135 worth of paint products, while factories in Ontario had an output valued at $9,660,171. The total production in 1925 included $19,530,082 worth of products for sale and $2,704,186 worth of intermediates for further use in the producing plants. In 1924, products for sale were valued at $18,187,681 and intermediates at $2,013,143. Mixed paints ready for use was the chief product, with varnishes of next importance. Only 4 firms corroded pig lead for the production of basic carbonate white lead. Canada's imports of paints, pigments, and varnishes during the calendar year of 1925 totalled $3,853,853 in value, as compared with $3,448,167 in 1924. Export values also rose slightly to $498,760 from $459,761 in the preceding year.

Soaps, Washing Compounds, and Toilet Preparations

Production of soaps, washing compounds, and toilet preparations in 1925 was valued at $17,388,506, which was 1·4 million dollars above the total for the preceding year. Active plants in this industry numbered 88, as compared with 66 in 1924. Forty-seven plants in Ontario had a production worth $11,092,205 in 1925, and the output of the 23 plants in Quebec was valued at $3,648,141. There were also 7 plants in Manitoba; 1 in New Brunswick; 4 in Alberta; 1 in Saskatchewan; and 5 in British Columbia.

Representing a capital investment of 14 million dollars and employing 1,446 persons, the 36 soap plants in 1925 had a combined output worth $13,568,252. In 1924 the 33 reporting plants produced $13,187,267 worth of commodities. Production of household soaps in 1925 increased nearly 6 million pounds, while the output of laundry soaps and soap chips dropped about 4 million pounds. The production of toilet soaps, soap powders, and other commodities in this industry, except washing compounds, was about the same as in the preceding year.

The washing compounds industry includes those firms manufacturing washing compounds, javelle water, ammonia powder, and similar products which are used to some extent instead of soap for certain household purposes. There were 21 plants with a production valued at $500,126 in 1925, as compared with 9 plants and an output worth $334,470 in 1924. For the most part, concerns in this group are small and the value of production is usually considerably in excess of the investment in plant and equipment. Many of the products are very useful, however, and there is a good market for the output.

While considerable quantities of perfumes, cosmetics, and toilet preparations are made as minor products of several other industries, the manufacture of these commodities as principal products has been carried on in Canada for a number of years. In 1925 there were 31 plants in this industry as against 24 in the preceding year. Production at $3,320,128 was nearly a million dollars higher. Most of the products consisted of toilet preparations, including perfumes, hair tonics, tooth paste, etc., but there was also a small production of liquid and toilet soaps in this industry.

Inks, Dyes, and Colours

Printing inks, writing inks, dyes, and dye soaps, printers' rollers and composition and paints, stains and enamels, were the principal products of this industry in 1925. Production of printing inks reached a total value of $1,442,512 in 1925 as against $1,348,850 in 1924. Writing inks, mucilage, and paste reached a value of $242,199 as against $257,940 in the previous year. Dyes and dye soaps manufactured during the year had a selling value of $360,785 as against $393,894 in 1924. The 27 plants operating in 1925 had a total production worth $2,749,807, as compared with 24 plants and an output valued $2,656,400 in 1924. Five plants made dyes and colours as their principal product; 13 made printing inks or printers' rollers; and 9 manufactured writing inks. A new plant in Ontario for the production of food colours, carbolic acid, and other products was opened during 1925.

Wood Distillates and Extracts

Output values receded to a total of $1,989,996, as against $2,283,422 in 1924, and $2,743,295 in the preceding year. The number of plants in operation dropped from 12 to 10, and capital employed declined to $2,287,109 from $2,784,681 in the previous year. Grey acetate of lime made for sale was nearly 1·5 million pounds above the quantity reported in 1924. Production of formaldehyde was less by nearly 240,000 pounds, and the quantity of acetone made was only a third of the amount made in 1924.

Miscellaneous Chemical Industries

A number of firms operating in Canada produce chemicals or allied products which do not naturally fall in any of the previous groups; a miscellaneous group has accordingly been made and the industries therein have been divided into 9 main classes, namely: adhesives, baking powder, boiler compounds, celluloid products, flavouring extracts, insecticides, polishes and dressings, sweeping compounds, and chemical products not elsewhere specified. Production in this group in 1925 totalled $10,699,162 in value, and employment was given to 1,689 persons during the year.

Prices

Based on average prices in 1913 as 100 the index number for chemicals and allied products fell from 161·8 in 1924 to 157·1 in 1925.

Crude coal tar was on the average a little higher in 1925, the price being $9.16 per barrel, as compared with $9.01 in 1924.

Sulphuric acid 66° Baumé was $2.25 per cwt., in small lots in 1925, and $2.34 in 1924.

In spite of the tendency to cut prices, white lead averaged $15.36 per cwt., as compared with $14.75 in 1924. This was due to the higher pig lead prices. Pure linseed oil putty dropped from $6.00 per cwt. in 1924 to $5.87 in 1925, and pure orange shellac from $4.78 per gallon to $4.13.

Lump alum fell from $2.80 per cwt. in 1924 to $2.67 in 1925. Bleaching powder 35–37 per cent. remained at the price attained in December, 1924, viz., $2.00 per cwt. Soda ash, 58 per cent. light, was $1.89 per cwt., as compared with $1.94 in 1924. Caustic soda, 76–78 per cent. solid, remained at $3.25 per cwt. Glycerine refined was 21½c. per pound from September, 1924, to October, 1925, but rose to 23c. in November and to 27½c. in December. The average price for the year was 22c. per pound, as compared with 20¾c. in 1924. The rise at the end of the year was due to a strong demand for the commodity for anti-freeze uses. The price of wood alcohol 97 per cent. was the same as in 1924, viz., 87c. per gallon.

Scientific Selling—Scientific Production

AT the general session on "Efficient Salesmanship" at the Advertising Convention at Olympia, Sir Robert Hadfield was unable to attend and speak, but sent the following message:—

"I should have liked very much to have been present to support the President of the Board of Trade on the subject of the importance of efficient salesmanship to the Empire, as I have long realised the vital necessity of scientific selling as the corollary to scientific production. It seems to me it is of but little use for the manufacturers of this country to spend large sums of money on research in their laboratories, on technical education and training in the schools of the country, and on up-to-date machinery in their works, so as to produce the best possible machinery and goods at the lowest possible price, if they do not employ equally competent means and exercise equally great energy and enterprise in the marketing of their products at home, whether as regards the friendly markets of the Empire Overseas, or the neutral markets of the world. I wish every success to the conference which the Sales Managers' Association have organised, and to the Association itself in its efforts to raise the standard of salesmanship throughout the nation and the Empire.

Canadian Salt Production

SALT production in Canada continues to increase; the high record of 233,746 tons produced in 1925 was beaten by a new high mark of 262,547 tons in 1926, according to final statistics just issued by the Mining, Metallurgical and Chemical Branch of the Dominion Bureau of Statistics at Ottawa. This year's output value was reported at $1,480,149, as compared with $1,410,697 for the 1925 production. The average price for all grades declined somewhat, being $5.63 per ton in the year under review, as against $6.04 in 1925. Imports of salt into Canada were recorded at 188,401 tons appraised at $1,036,594. Exports of Canadian salt amounted to 1,164 tons valued at $19,423.

Methods of Electrometric Control in Industry

Some Recent Developments

In the following, which is abstracted from a paper recently presented by Mr. Henry C. Parker before the Division of Industrial and Engineering Chemistry of the American Chemical Society, the present position of electrometric control in industry is considered, and there is described apparatus in use for this purpose in power plant, mercerising, sugar treatment, etc.

DURING the past few years the progress in the use of electrometric control in industry has been quite marked. However, the advantages of these methods are only just beginning to be appreciated in the commercial world. The future progress in the field appears to be limited only by the complexity of some of the problems and by the not infrequent necessity for specifically adapting the control principles to individual cases. Although this engineering development work increases the cost of these installations, the advantages gained by obtaining a true record of concentration, as well as a more accurate control, have been proved to far outweigh the initial expense in at least the majority of cases where electrometric methods have been tried.

The recent progress in electrometric control has been given considerable impetus by the development of improved electrodes and cells. A satisfactory type of industrial conductivity cell is shown in Fig. 1. The electrodes are made of brass rods capped with gold and moulded with Bakelite into a brass tube. The whole may be inserted through a gate valve, making a conveniently removable and sturdy cell, suitable for neutral or slightly acid solutions. The Bakelite makes tight joints with the brass rods and tube, which are capable of withstanding 300 lb. hydrostatic pressure without the use of any packing glands or cements. The gold caps are platinised and then sand-blasted to drive the platinum back into the gold, forming a surface which is such that polarisation is negligible and which, under normal conditions of operation, requires no subsequent platinising. At present these cells are being successfully used for measuring surface condenser leakage in a number of power plants in various parts of the country. It has not been found possible to eliminate the use of glass in the construction of cells for some types of service. Such cells are generally protected by a metal or composition case.

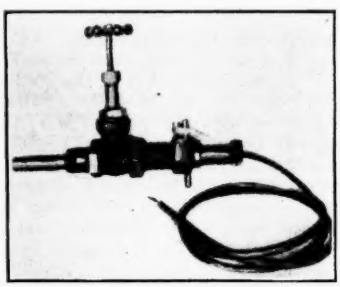


FIG. 1.—REMOVABLE-TYPE CONDUCTIVITY CELL.

As regards the measurement of H-ion concentration, a flow-type quinhydrone electrode has been evolved, which has given satisfaction in several types of service for over a year. The quinhydrone is put into cloth bags which are placed in an adapter at the base of a flow channel. The test solution flows past these bags of quinhydrone, becoming sufficiently saturated to supply the gold electrode. This apparatus can be used advantageously to obtain a record or a control through a p_H range of about 3 to 7·5. In most solutions correct results will be given to a p_H of 8·5, but the increased solubility of the quinhydrone makes its operation rather expensive. The rate of solution may be governed to some extent by using cloth bags of heavier material. This method of introducing the quinhydrone is much more convenient than regulating the rate of dropping of a saturated solution. In addition, automatic temperature control has been developed for both H-ion and conductivity apparatus.

Control in Various Industries

In the following sections it has been found most convenient to divide up the descriptions of the different types of control under the headings of the various industries in which the particular control is operating. In a few industries both H-ion and conductivity controls are being utilised but in the majority the development has not progressed to this extent. Some of the first adaptations of conductivity control were made in the mercerising industry. Among the several possible applications in this industry, the control of the acid bath, which is used for neutralising the caustic carried over in the yarn from the mercerising bath, is one of the most important. Close control of this bath is essential both to increase the uniformity of the dyeing and to prevent the deterioration of the yarn. The control obtained automatically is several times as accurate as that obtained by other methods.

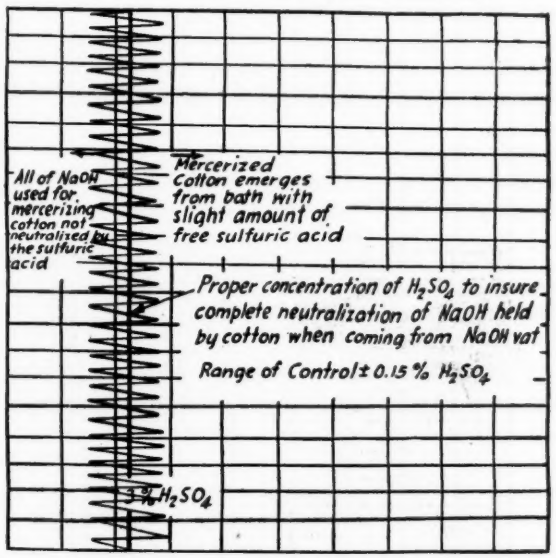

All of NaOH used for mercerizing cotton not neutralized by the sulfuric acid
Mercerized Cotton emerges from bath with slight amount of free sulfuric acid
Proper concentration of H_2SO_4 to insure complete neutralization of NaOH held by cotton when coming from NaOH vat
Range of Control ± 0.15 % H_2SO_4
3% H_2SO_4

FIG. 2.—CONDUCTIVITY RECORD IN CONTROL OF ACID BATH IN MERCERISING PROCESS.

In Fig. 2 is shown a record obtained during the operation of automatic control in a plant that has been using the method successfully for about four years. In this type of control a solenoid valve, placed in the acid line, is operated automatically to keep the bath in the neighbourhood of 3 per cent. acid. When the record is at the left of the line on the chart, which represents a concentration of 3 per cent., the valve is open, and when at the right it is closed. If increased accuracy is desired, a by-pass may be used in the chemical supply line, to supply the minimum requirements of the system, while the solenoid valve supplies a slight excess. However, this type of control is capable of accuracy only in those cases where a tank or pond is available in which the cells may be placed and in which both mixing and equalisation may take place. It is also limited to those cases where the flow is essentially constant.

Power Plants

In power plants there are many problems that may be solved by electrometric control. One of the most important of these is the detection of surface condenser leakage, especially in stations using salt water for cooling. The prompt detection of leakage by conductivity instruments operating with alarm contacts has eliminated the expense of cleaning boilers which otherwise would have been "salted up." The same measurement in plants using surface water for cooling is only of slightly less importance, since measurements of leakage are necessary to prevent scaling of the boilers and to determine the efficiency of the turbines.

H-ion control of boiler feed water has recently been perfected. This is another important power plant application.

The automatic installation in the Public Service Gas and Electric Company's station at Perth Amboy, N.J., is shown in Fig. 3. The control is operating to regulate the addition of caustic soda and sodium phosphate to the boiler feed water and to keep the latter at a constant p_H. The advantages are an increase in uniformity of the alkalinity in the individual boilers from day to day, and also in the boilers as a whole. This has resulted in less blow-downs. The control likewise acts as a degree of protection from condenser leakage, since additional chemicals will be added automatically to compensate for any leakage. In Fig. 4 are shown the daily operating results obtained over three periods of two months each, during the first of which hand control was in use, during the second the control was by hand but governed by the recorder readings, and the third was a period of automatic control. The maximum, minimum, and average daily alkalinities of the bank of boilers are indicated on the curves—the circles representing the averages. It can easily be seen that the automatic control has enabled the keeping of the boiler alkalinity within much closer limits than was obtained by either of the other two types of control.

The proper setting of the control point is determined from the daily alkalinity analysis of the boiler water. By changing the setting to correspond to this analysis, it is, of course, evident that any errors due to inequalities among the tungsten electrodes are largely eliminated. When operated in this manner, electrodes have been in successful use over periods as long as six weeks. In this particular installation, where the p_H averages about 8, it has been found that the electrodes are practically free from drift.

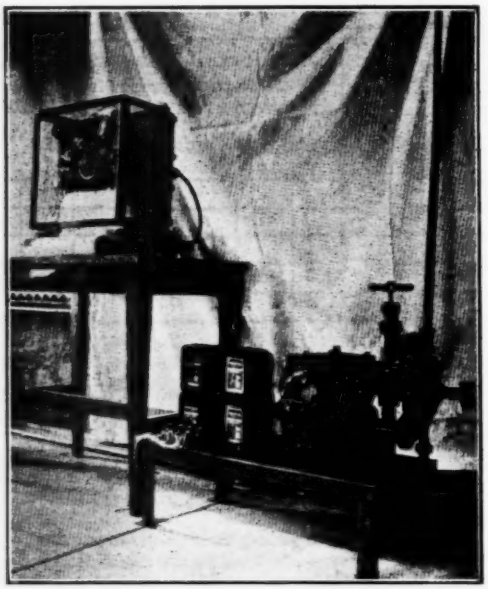


FIG. 3.—RECORDER-CONTROLLER AND AUTOMATIC VALVE USED IN BOILER FEED-WATER CONTROL.

In some of the plants using zeolite-softened water, sulphuric acid is being added both to reduce the boiler alkalinities, which may build up to a dangerously high value, and to maintain a required sulphate-caustic ratio. The flow-type quinhydrone electrode has been successfully used, in this application, to hold the acid-treated water to a definite H-ion concentration. Automatic control appears feasible, but at present the recorder readings are used as a guide for the proper setting of a flow-proportioning device. When kept at a constant H-ion concentration, additional acid is added if the alkalinity of the untreated water increases. It would therefore be expected that this control would supply a feed water having an approximately constant sulphate-bicarbonate ratio which, after being concentrated and broken down (to caustic) by a definite degree in the boiler, would provide a definite sulphate-caustic ratio. In the first plant to use H-ion control this desirable result has been accomplished within close limits. This method presupposes an accurate control of the boiler blow-down and this has been supplied by conductivity measurements.

The control of the boiler blow-down point is a very important electrometric application, from the standpoint of both saving heat and the prevention of heating and scaling. Conductivity measurements have been used successfully for this purpose for several years. When a very uniform method of feed-water treatment is used, such as zeolite softening or automatic H-ion control, the conductivity of the boiler water (at a definite temperature) may be related to its concentration. In some cases the alkalinity has been found practically proportional to the conductivity. Conductivity measurements, of course, cannot distinguish between the accumulation of salts and the alkalinity. The hydroxyl ion has approximately twice the mobility of any other ion in such a mixture, so the conductivity measurements, in most cases, are found to be rather closely related to the causticity. When the salts and the causticity are kept in a definite ratio as best boiler operation undoubtedly indicates, it is evident that the conductivity may be used to measure the total concentration.

Measuring the conductivity of boiler water with a portable instrument, calibrated in conductance units, is considerably easier than an analysis by titration. The ideal method of measurement would consist in the installation of a cell inside the boiler. This is impracticable, at least for high-pressure boilers. One type of cell has, however, been installed in a continuous blow-down line at 150 lb. pressure. Indications are that the insulation will last at least two months under these conditions, after which it may be renewed. In this installation a record of boiler-water conductivity is being obtained and the blow-down valve is adjusted to keep this quantity constant. Analysis has shown that by this method the alkalinity of the boiler has been kept within $\pm$ 10 p.p.m.

The control of evaporator blow-downs is closely related to that of boilers, with the advantage in the former that the conductivity cells may be installed in either the blow-down line or directly in the evaporator. These measurements have resulted in less scale formation and in the saving of heat. An alarm would be used to indicate the correct time for a blow-down. It would also be feasible to operate a blow-down valve automatically, to keep the conductivity in the evaporator at a constant value.

Sugar Industry

In both the beet and cane sugar industries there are several important applications for electrometric control. Probably none of these is more important than the second carbonation of beet sugar. H-ion records have been obtained with the tungsten electrode, in both this process and in the defecation of cane sugar. In both cases a considerable improvement in control was obtained when the operator was using the recorder chart to determine the proper setting of the valve. An experimental installation of automatic control of the liming of raw cane juice is being operated during the present season in Porto Rico. Another installation is using an H-ion recorder during the present campaign in Cuba. The recorder readings are being used in connection with signal lights to determine the proper valve opening for the addition of lime in the defecation process. This recorder has a scale reading in p_H units. The readings of the tungsten electrode are checked against the quinhydrone electrode, and if there is a discrepancy in the readings the pen is shifted to give the correct value. The flow-type tungsten electrode is used in this application. The solution is cooled to the neighbourhood of 60° C. by flowing through the cooling coil to the left. It then flows up past the tungsten electrodes and calomel cell. Automatic temperature compensation is provided. The additional valves shown in the photograph provide means for draining the cooling oil and blowing live steam through the apparatus for cleaning and sterilising purposes.

The tungsten electrodes have invariably been found to indicate correctly *changes* in H-ion concentration. In some solutions, however, they have been found to possess a slightly different p_H-voltage characteristic from that determined with buffer solutions. In these cases, if an auxiliary method for checking is used, and if the control setting or the pen is shifted accordingly, a quite satisfactory control or record may be obtained. Since some type of auxiliary check, such as a titration or a measurement with the quinhydrone elec-

trode, is generally in use already, this limitation is not serious. A check is usually necessary not more frequently than once a day.

The dip-type quinhydrone electrode with portable potentiometer is being used satisfactorily by several sugar companies for the determination of H-ion concentrations. This combination has been found exceedingly convenient, and routine

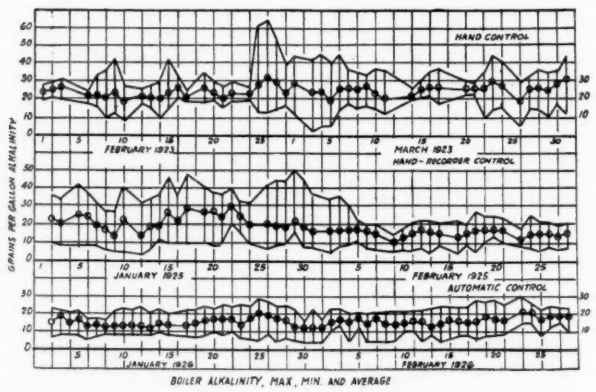


FIG. 4.—IMPROVEMENT IN ALKALINITY CONTROL OF BOILERS DURING AUTOMATIC CONTROL.

measurements may be taken probably more rapidly than by any other method. This method is particularly adapted to the measurement of the dark-coloured solutions where colorimetric methods fail. Many sugar companies are likewise using the conductivity method for the determination of sugar ash.

Other fields in which electrometric control have been applied are waterworks and water purification plants; in the contact sulphuric acid process, for keeping the concentration of the absorbing acid at its proper value; in nickel-plating baths (dip-type quinhydrone electrode); and in the paper, baking, flour, dairy, tanning, ceramic, lithopone, etc., industries, and elsewhere.

Discussion

The progress of electrometric control has depended almost entirely upon the development of simplified and fool-proof cells and electrodes. The electrical measuring and control apparatus has been in a high state of perfection for several years. The present expansion has been due almost entirely to recent improvements in cells and electrodes which have finally been demonstrated to be commercially practicable. In applying electrometric control to industry, it is at times very difficult to predict whether a given problem is likely to be solved by this means. It is likewise almost impossible to predict the correct range for a recorder or controller, without making preliminary measurements at the plant in which the control is to be installed. Frequently it is advisable to permit the operator to make preliminary measurements in order to collect data for calibrating the final instrument. While making these measurements he gains considerable knowledge and later no difficulty is experienced in changing over to recording or control apparatus.

Recording apparatus which can be applied to a large number of quite different problems has helped to solve this difficulty. The recorder that uses a reference cell, in which various solutions may be placed, is a good example of this adaptability. Even in using this instrument, however, the proper range must be employed in order to obtain the desired sensitivity. Instruments have also been made with variable ranges in an attempt to solve these difficulties.

While the preceding description included the most important fields where electrometric control is at present employed in industry, no attempt will be made to summarise the possible uses to which such control may be applied in the future. In all the cases cited there are at least one or more installations in successful operation at the present time. Present progress is necessarily slow, owing to the necessity for overcoming various obstacles, many of which are peculiar to particular installations. After more experience has been obtained along these lines, it is believed that the subsequent progress will be relatively rapid.

South Staffordshire Mond Gas Co.

Extended Chemical Manufacturing Powers Sought

THE Unopposed Bills Committee of the House of Commons has further considered a Bill promoted by the South Staffordshire Mond Gas Co., whereby powers are sought, among other things, to manufacture, sell and deal in by-products or residual products of any gas or gases manufactured by it; to manufacture paints, preservatives, antiseptics, disinfectants, medicines for human beings and animals, any other chemical compounds of a like description, either from by-products or other materials; to manufacture, sell and deal in hydrogen, nitrogen, carbon monoxide, chloride of ammonia, and nitrate of ammonia, as by-products of producer gas.

The company make producer gas and supply it for other purposes than lighting, but do not supply it to domestic consumers. The company has already done a large amount of research work in relation to its by-products and the like, with favourable results, and with the new powers applied for would be able to compete in markets hitherto monopolised by Germany and America. The committee had previously felt that there was considerable difficulty in granting the clause referring to the manufacture of gases and chemical compounds as by-products of producer gas, and adjourned that the promoters might submit its wording to the Government Department concerned to find out whether they had any objection. As the result of discussions with the Ministry of Health and the Home Office, certain provisos relating to any general or local laws applying to the processes in question were added to the clause.

In the course of the hearing Mr. J. F. Ronca (Director of Gas Administration of the Board of Trade) expressed the view that the larger gas companies might well be given the kind of power now applied for subject to there being an assurance that they did not indulge in uneconomical chemical industrial experiments.

The Committee came to the conclusion that they would have to make a special report to the House with regard to the difficulties they felt as to the granting of the clause. If the company would prefer it, however, the Committee would report the Bill for third reading at once without the clause.

Mr. C. E. C. Brown, for the company, said he would inform the Committee later as to the course the company preferred.

New Food Preservative Regulations

THE Secretary of the Scottish Board of Health has issued to local authorities a circular letter enclosing a copy of the Public Health (Preservatives, etc., in Food) Amendment Regulations (Scotland), 1927, which take the place of the provisional regulations dated April 25, 1927. The new regulations reproduce the provisional regulations and contain, in addition, a few minor amendments of the principal regulations. The Secretary draws the attention of the local authorities to the fact that traces of some of the prohibited preservatives and colouring matters are naturally present in certain foods—*e.g.*, boric acid and benzoic acid in some fruits, and copper in peas and other vegetables. The quantities so present are usually insignificant, and are much less than those that would be required for effective preservation or artificial colouring. The regulations prohibit the importation, manufacture, or sale of articles of food containing added preservative or colouring matter. Accordingly it is desirable that the local authority, before instituting legal proceedings in respect of the presence of small traces, should satisfy themselves that the prohibited substances have been artifically introduced.

Pneumatic Fuel Conveyors

THE "Nuvako" system of pneumatic conveying is described in a booklet which has recently been received from Ashwell and Nesbit, Ltd., of Bedford Row, London, W.C.1. While the pneumatic conveying of such materials as grain and similar materials has been used for a considerable time, it is only within recent years that this method has been adopted for heavy and irregular shaped materials, such as coal, iron ore, sulphur, soda, etc. In the "Nuvako" system the suction method is usually employed, although if necessary, the blowing or induction systems can be employed.

Chemical and Metallurgical Corporation

New Works Nearing Completion

AT the annual meeting of the Chemical and Metallurgical Corporation, held in London on Monday, the Chairman (Sir Frederick Mills) stated that the company were not entirely dependent upon the fluctuations in the market price of lead and zinc and the products thereof, inasmuch as their processes were those of conversion from ores to metals, and as they were not committed to any particular raw materials they were entitled in a depressed market for finished products to expect to buy their raw materials at an equivalent and lower price. It was the policy of the company to remain for the present independent in regard to the supply of raw materials, and these were available in considerable quantities in various parts of the world.

With respect to the new works at Runcorn, portions of the plant were now approaching completion, and it was hoped that active operations would be commenced in the course of a month or two, and that the whole of the plant, as at present designed, would be in operation by the end of the current year, or very shortly afterwards. Mr. Stanley Smith and his staff had, during the current year, been occupied in research work in discovering and perfecting the best manner by which the platinoids at present being produced in South Africa might be most cheaply and advantageously recovered for the purpose of the refiners. Here they had a most useful adjunct to their process, because it was not merely a separate addition to their operations, but it would work in very well with their main process. After the extraction of the platinoids they would retain and have for disposal the copper, nickel, and precious metals, which would have cost very little to produce.

Reverting to the main process, their operations at Stratford had now ceased, because nothing remained to be discovered on the details of their process, and as they had actually demonstrated the whole process from beginning to end, and had produced the finished products of a good merchantable quality, there could be no doubt of the success of the process itself. It was a fascinating prospect to be on the eve of setting into actual operation a process which had for its object the elimination of many of the costly and difficult intermediate processes which had hitherto been necessary in the world practice of producing lead and zinc and the various compounds thereof, such as red lead, litharge, zinc oxide, etc., from complex ores. Their associates, both in America and on the Continent of Europe, were looking forward with equal interest to the result of their efforts with a view to proceeding along similar lines in co-operation with the company.

The Nation's Trade Position

The Necessity for Expanding Abroad

A SURVEY of the trade position of this country which was made on Tuesday by the House of Commons on the Board of Trade Vote revealed the consensus of opinion that this country must look more and more to the Empire markets for development of overseas trade. In its examination of methods by which British industry could be brought back to its former prosperous condition, the House expressed a bias in favour of combinations both in manufacturing and in selling.

Sir Philip Cunliffe-Lister, President of the Board of Trade, in his review of the trade position, quoted statistics of our share in world trade, from which it is to be deduced that our exports have fallen compared with pre-war, not only absolutely, but relatively, to the export trade of other countries. From his statistics he seemed to conclude that imports must be restricted and exports encouraged, that the development of Empire markets was of great importance, and that the home market was now relatively much more important for manufacturers than it was before the war.

The seriousness of the outlook was stressed by Sir Robert Horne in relation to the headway being made by the United States. This competition from America was likely to become still greater, because the home market there was now reaching the point of saturation and the exports from the United States would, in future, tend to become greater.

Amatol for High Explosives

Viscount Chetwynd's Claim

VISCOUNT CHETWYND'S claim for an award for improvements in the manufacture of amatol and in the filling of high explosive shells was considered further on Monday by the Royal Commission on Awards to Inventors, sitting at the Law Courts under the presidency of Mr. Justice Tomlin.

Questioned by Mr. Trevor Watson, Viscount Chetwynd said he did not agree that the purpose of his visit to France was to report to the Ministry of Munitions on what he considered the best methods in use in French shell-filling factories. He was an original member of the mission, but was appointed to it at his own request so that he might see the organisation and administration of the French factories.

Sir Frederick Black, Director-General of Munitions Supply from 1915 to 1917, was called as a witness in support of the claim. He said Viscount Chetwynd was appointed simply as an administrator, and it was no part of his duty to devise methods of filling shells. Mr. Armstrong, liaison engineer officer between shell-filling factories, spoke of the utility of a screw plunger introduced by Viscount Chetwynd for filling shells, and said that on his recommendation factories in the United States also adopted it.

After the conclusion of evidence in support of the claim, Mr. Justice Tomlin said no one would dispute the very distinguished services rendered by Viscount Chetwynd, but there had been some recognition of them. Viscount Chetwynd said he was made a Companion of Honour; that was in respect of the supply of shells for the Battle of the Somme. Mr. Justice Tomlin commented on the long delay in presenting the claim. It seemed to him doubtful whether the claim ought to be admitted. There might be hundreds of people who had done things without any intention of making a claim, who, if a claim of this sort were entertained, might say, "If he, why not I?" It might open floodgates, and the Commission might have to embark for years upon a series of cases of this character. Mr. Trevor Watson said the Commission had been sitting two years since the claim was put forward. The claim had been before the investigating committee, which passed it as a proper claim for the Commission to consider.

Arguments were addressed to the Commission by counsel in regard to Viscount Chetwynd's status in Government employ as affecting his right to make a claim, and the matter then stood over until after the vacation.

Low Temperature Carbonisation in Canada

Low temperature carbonisation of coal on a large commercial scale is proposed for Canada, according to a recent announcement at Ottawa. A syndicate, headed by Mr. Morgan J. O'Brien, is applying to Parliament for a Federal charter for a three million dollar corporation. Plans are said to be practically complete for the construction of three 1,000-ton per day plants, one to be in Ottawa and two in Western Ontario. These plants are to be operated by subsidiary companies, and steps are being taken for the organisation of other subsidiary companies to operate plants in Montreal and Quebec. The proposal is to carbonise Canadian slack from which a smokeless fuel, said to be equal to the anthracite coal now being sold on Canadian markets, would be produced, as well as gas and oil by-products. Mr. O'Brien states that it is the intention to convey Nova Scotia coal to Ontario and Quebec by water during the open season of navigation, while Alberta coal will be treated in the west.

Japanese Government Dyestuff Subsidy

THE Japan Dyestuff Industry Association, backed by the Ministry of Commerce and Industry, has decided to extend the sphere of its activity to chemicals and drugs. It has issued a monthly magazine *Dyestuffs and Chemicals*. It is stated that the Japanese Government intends to supply national dyestuffs to the extent of yen 12,000,000, of which yen 4,000,000 is to be granted as subsidy for encouraging dyestuff manufacturing. The Ministry is supporting the organisation of a pan-synthetic chemical industry body, including manufacturers of dyestuff and synthetic chemicals and spices. The Ministry has set aside yen 300,000 to encourage study in this field.

Bouverie House Tours

A Visit to the Charterhouse

THE popularity of the series of tours round the City of London, under the guidance of Mr. Allen S. Walker, which is being arranged by THE CHEMICAL AGE for the benefit of readers and their friends, was clearly shown on Wednesday, when a large party assembled at Bouverie House. On this occasion a visit was paid to the Charterhouse in Smithfield—a piece of old London that has enjoyed a long and varied history. The Charterhouse was founded as a monastery for the Carthusian Monks in 1371, on the site of what had been the burial ground of 50,000 victims of the Black Death twenty-one years before. It existed as a monastery until the reign of Henry VIII, when its prior was executed, and it passed into the hands of Lord North, who built a house for himself on the site of the Little Cloister. Queen Elizabeth and James I were both entertained there at various times. In 1611 the Charterhouse passed to Thomas Sutton, who founded in it a hospital for 80 indigent men and a school for poor boys. The school (which included among its students Thackeray, Addison, Steele, and John Wesley) was removed to Godalming in 1872, but poor men are still housed in the old Charterhouse in London. The old school buildings around the Cloister have been taken over by the Merchant Taylors' School in Rutland Gate, and some of their wonderful sixteenth century architecture impressed the visitors considerably. A brief visit was also paid to Smithfield meat market before the party returned to Bouverie House for tea.

On Wednesday of next week Mr. Walker will take readers round the Central Criminal Courts and Christ Church, Greyfriars. Those who wish to take part in this tour should apply for tickets as early as possible, and assemble in the Publications Hall, Bouverie House, Fleet Street, at 2.45 p.m.

Pathetic Death of a Research Chemist

Inquest on Dr. E. N. Mottram

THE body of Dr. Edward Neville Mottram, the Manchester research chemist and recently holder of the Sir Clement Royds scholarship, who disappeared from his home a fortnight ago, was recovered from a reservoir in Lyme Park, Cheshire, on Tuesday evening. At the inquest on Wednesday the jury found a verdict of suicide during temporary insanity.

Mr. R. E. Mottram, who gave evidence of identification, said that his brother, Dr. Mottram, who was 27 years of age, was a Master of Science and Doctor of Philosophy of Manchester University, and was engaged at the University as a research chemist under Professor Lapworth. Dr. Mottram had been threatened with a nervous breakdown and had suffered from insomnia, and in consequence had been granted three months' leave of absence from the University. He had been much depressed, and once remarked that his brain was giving way and that he had forgotten all the chemistry that he had ever known. The coroner asked whether anything in Dr. Mottram's professional studies was worrying him, and the witness replied that he used to say: "Fancy me being here ten or twelve years. And what is there at the end of it? There are some of my friends going after jobs, and have been out for months, and they don't even offer you a labourer's wage. there are some jobs, but there are five hundred applying for them." He was not worrying about his own future, stated the witness, because if he had never done any job he would have been all right at home. He was worried to think he should do all this education work and then not get a labourer's wage for it.

Dr. John Orr said that Dr. Mottram had been to see him on the afternoon of the day of his disappearance and complained mostly of want of concentration and memory, and seemed very worried about the duties of an appointment he had had offered to him by his professor.

The Coroner, in his summing up, said the evidence revealed a very sad case indeed. Here was a young man, evidently a brilliant scholar, who saw no hope in the outlook for those in his position. For a chemist of his kind there were bright openings, although, naturally, owing, he supposed, to keen competition, the pay was very bad—bad compared with the money spent on one's education.

Chemical Matters in Parliament

Conveyance of Duty Free Spirit

In answer to a question by Dr. G. C. Clayton (House of Commons, July 26), Mr. McNeill said that, as he explained in answer to a question on June 30, the Finance Bill would make it possible to allow, under suitable regulations, conveyance by tank wagon or pipe line in the case of methylated spirits, but not in the case of spirits which, though denatured, were not methylated. If he was supplied with full particulars of any specific case he would be happy to go into the matter more fully.

Expenditure on Fuel Research

In reply to a question by Mr. C. Edwards (House of Commons, July 26), the Duchess of Atholl in a reply tabulated in the official report stated that the net amount in the estimates of the Department of Scientific and Industrial Research for fuel research and the net amounts actually expended were as follows:

	Net Estimate.	Net Expenditure.
	£	£
1922-3	45,779	46,772
1923-24	32,540	42,751
1924-25	43,191	48,142
1925-26	61,536	76,147
1926-27	91,863	88,350

The figures showed that the increase in expenditure considerably exceeded the £30,000 authorised by the late Government. The cost of additional accommodation made necessary by the extension of the work had been borne on the Office of Works' Vote, and was not included in these figures. As regards the results obtained, she referred the hon. Member to the Annual Reports of the Fuel Research Board and other Reports from the Department of Scientific and Industrial Research.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

67 ("*Hydroloide*").—I should be obliged if you could put me in touch with the manufacturers of a preparation known as hydroloide, which I understand is used for waterproofing M.G. Litho Papers.

Vacant Appointments

ANGAS Professor of Chemistry in the University of Adelaide, South Australia. £1,100. The Agent-General for South Australia, Australia House, 112, Strand, London. October 1.

Professor of Chemistry in the University of Melbourne, Australia. £1,200. The Agent-General for Victoria, Victoria House, Melbourne Place, Strand, London. October 1.

Research Fellowships for work on textiles or any problem having a bearing on wool, in chemistry and other sciences. The Secretary, British Research Association for the Woollen and Worsted Industries, Torridon, Headingley, Leeds. July 31.

Lectureship in Fuel Technology, at Imperial College. Commencing £360 per annum. Sensible Heat Distillation, Ltd. (Coal Research), Fellowship. £175 to £200. The Registrar, Imperial College of Science and Technology, London, S.W.7. August 31.

Principal of the College of Technology, Leicester. £800-£1,000 per annum. Application forms, from the Registrar, to be sent to F. P. Armitage, Director of Education, Leicester Education Committee. August 20.

Research Fellowships in the Department of Glass Technology University of Sheffield. £175 to £200. The Registrar, The University of Sheffield. August 20.

From Week to Week

SIR ALFRED AND LADY MOND left London on Saturday for the Continent.

MR. AND MRS. ROBERT MOND left England last week for Vichy and Dinard.

THE "DAILY DISPATCH" artificial silk exhibition will be held in Manchester early in October.

THE BRITISH PETROLEUM CO., LTD., have acquired premises at Cardiff Docks for the purpose of controlling sales in the South Wales area.

THE APPOINTED DAY from which the standard railway charges provided for in the Railway Act, 1921, shall operate has been fixed by the Railway Rates Tribunal as January 1, 1928.

MR. V. R. MITTON, works manager at the Birkenhead, South Australia, works of Cresco Fertilisers, Ltd., has been appointed manager of the company's new works at Port Lincoln, Eyre's Peninsula.

AS A RESULT of complaints of fumes emanating from Courtaulds' Wolverhampton factory, the clerk of Tettenhall Council has received a letter from the firm stating that they are installing a plant for the treatment of the fumes, and it will be in operation in a few weeks.

THE SECOND INTERNATIONAL FAIR in Salonika will be held from September 18 to October 3 this year, and goods destined for the Fair will be exempt from duties or taxes, and a reduction of 50 per cent. will be granted on the usual railway tariffs on all the Greek railway lines.

A STUDY IS BEING MADE of English and American China Clays at the Columbus branch of the Bureau of Standards for the purpose of finding out to what extent American clays can be used to supplant British products. None of the properties yet studied seems to show any fundamental difference between English and American clays.

THE DEVELOPMENT OF THE GYPSUM DEPOSITS at Mabou, Nova Scotia, which were taken over last summer by the Ontario Gypsum Co., of Toronto, has been started and the first steamer load of 2,200 tons was cleared recently. Another steamer will load a cargo shortly for England, and the industry is expected to have a busy season.

AN APPEAL HAS BEEN MADE to the Chancellor of the Exchequer by the National Union of Manufacturers against the decision of the Board of Inland Revenue claiming income-tax at 4s. in the £ on the expenditure incurred for application under the Safeguarding of Industries Act and the Merchandise Marks Act. The Board of Inland Revenue urges that sums expended by a trader in making and supporting applications under these Acts would represent capital outlay, and would not be money wholly and exclusively laid out for the purposes of trade.

THE POSSIBILITY OF PRODUCING PAPER PULP from Australian woods has been investigated recently, and the research officer of the Commonwealth Institute of Scientific and Industrial Research reports favourably on the results. Australia has practically no softwood forests, and the investigations have been to discover whether it is practicable to produce paper from hardwood. The principal Australian forests are composed of eucalyptus, and it has been found that about 30 per cent. of ground wood, or mechanical pulp from certain immature eucalyptuses, can be used with sulphite pulp from similar woods. Adjustments in mechanical conditions in sulphite cooking have resulted in a saving in the cooking time, with an increase in yield and an improvement in quality of the pulp for newsprint. Samples of the paper produced by this process have been described as eminently satisfactory by the Council for Scientific and Industrial Research, and interesting developments are expected.

UNIVERSITY NEWS.—*Manchester:* The Council of Manchester University have made the following appointments:—lecturer in electro-metallurgy, Mr. E. O. Jones, B.Sc., A.R.S.M., A.I.M.M.; assistant lecturer in chemistry, Mr. Glyn Owen, M.Sc. The Sir Clement Royds Memorial Research Scholarship in chemistry has been awarded to Mr. William Bradley, M.Sc. Professor H. B. Dixon has been appointed as representative of the University to the Berthelot centenary celebration, to be held in Paris in October. *Swansea:* Mr. Leonard Taverner, chief metallurgist to the British Copper Manufacturers, Swansea, formerly senior demonstrator in metallurgy at the Royal School of Mines, has been appointed to the assistant professorship of metallurgy at University College, Swansea. *London:* Mr. B. Topley has been appointed assistant lecturer in the Department of Chemistry at University College. Mr. E. R. Winton has been appointed senior assistant, and Mr. E. Ogden assistant in the Department of Physiology and Bio-Chemistry. *Leeds:* The University Court has decided, on the occasion of the British Association meeting in Leeds in September, to confer the honorary degree of LL.D. on Sir Arthur Keith, president of the British Association, and Sir Charles Parsons, and the honorary degree of D.Sc. on Dr. J. S. Haldane, Dr. N. V. Sidgwick, Dr. F. O. Bower, and Dr. R. A. Millikan (California Institute of Technology, Pasadena).

IMPORTS INTO POLAND during May of organic chemicals and products were valued at 6,790,000 gold zloty and exports at 898,000 gold zloty.

RECENT WILLS INCLUDE:—Mr. A. B. Reckitt, director and joint chairman of Reckitt and Sons, of Hull, £548,516 (net personalty £535,273).

THE NUMBER OF UNEMPLOYED INSURED persons engaged in chemical industry in Great Britain and Northern Ireland, in June, was: chemical manufactures 6,007, explosives 1,334, paint and varnish 682, glue, soap, and grease 6,006.

A WARRANT HAS BEEN granted by the Grangemouth Dean of Guild Court, to Scottish Dyes, Ltd., to erect at their factory at Earls Road, Grangemouth, a boiler-house, 40 ft. long by 29 ft. wide and 25 ft. high, estimated to cost £800.

IT WAS ANNOUNCED RECENTLY that the Tasmanian Government was not yet in receipt of any information that would justify it going on with the Bill for the encouragement of the rayon industry, which Italian interests propose to establish in Tasmania.

THE NEW AGRICULTURAL DEPARTMENT of the Leeds University has just been opened. The building which cost £56,000 was begun in 1924 and contains extensive chemical and biological laboratories for agricultural research. The original home of the Department will now be left entirely to chemistry.

A SUMMARY OF THE TRADE OF CANADA during the twelve months ended May 31 shows that imports of chemical products from the United Kingdom amounted in value to $4,696,527, and from the United States to $21,003,975. Exports to the United Kingdom in the same period were valued at $3,528,552, and to the United States to $8,303,251.

THE RAILWAY AND COAL COMMISSION on July 21 approved the amalgamation of two Sheffield colliery companies, the Sheffield Coal Co., Ltd., and Aston Coal Co., Ltd. In giving the decision of the Court, Mr. Justice Sankey said it was of the opinion that the amalgamation was of national interest and that the terms were fair and equitable to all persons affected thereby.

THERE IS AN APPRECIABLE QUICKENING OF INTEREST in smoke-preventing appliances, according to Meldrums, Ltd., of Timperley. Quite recently they have received orders for their furnaces and stokers for 78 boilers of various types from many different industries. There has also been a fairly large demand for refuse destructors, from the domestic type dealing with 25 lb. an hour up to one consuming one ton an hour. The number of orders received for their acid-resisting plant has also increased.

WHEN AN APPLICATION, FROM SYNTHETIC AMMONIA AND NITRATES, LTD., asking that Middlesbrough Corporation should cancel an option they hold on a piece of land on the north side of the Tees, was considered by the Middlesbrough Ferry Committee on Saturday, it was stated that the firm wished to extend their works, and that the holding of this option, by the Corporation, was hampering their industrial developments. As compensation for the cancelling of the option the firm offered to reimburse the Corporation for the whole of the rent paid since 1919, and on these terms the application was approved.

WHEN EDWIN DYKE WAS CHARGED at Newport (Mon.) on Monday, with stealing samples of steel sheet from the works of John Lysaght, Ltd., it was alleged for the prosecution that the samples were of a very special type of steel, the full process of which had been kept strictly secret by the firm; one of the steel pieces might be very valuable as information. For Dyke, who was employed at Lysaght's until 1919, and has since been working for another firm at Glasgow, it was contended that he simply visited his old works with no wrong intent. The Bench disagreed and ordered the case to be reheard on Wednesday.

DR. EDWARD R. WEIDLEIN, director of the Mellon Institute of Industrial Research of the University of Pittsburgh and president of the American Institute of Chemical Engineers, will spend the months of September and October in visits to European educational institutions, research laboratories, and chemical works. While in Europe he will confer with a number of educationists and laboratory directors regarding various problems in industrial research organisation and management. Dr. Weidlein is arranging to be in England during the period September 14-24, where he may be addressed c/o The Old Colony Club, 79, Fore Street, London. His continental trip will include Germany, Switzerland, Italy, and France.

Obituary

MR. ARTHUR WILLIAM SIMPSON, of R. H. Allan and Co., manufacturing chemists, London and Newcastle, on July 20.

MR. STANLEY HARVEY, A.A.C.I., formerly analyst in the State Health Laboratory, Melbourne, in a motor cycle accident at Melbourne on April 23.

MR. JOHN T. SHEARD, aged 69, of Wadsley Bridge, Sheffield, chief chemist to the Sheffield Gas Co., on Wednesday, July 20. Mr. Sheard died as the result of being knocked down by a tramcar earlier in the day. At the inquest on Friday, July 22, a verdict of "Accidental Death" was returned.

References to Current Literature

British

ANALYSIS. — A study of the determination of saccharin colorimetrically and by the ammonia process. A. F. Lerrigo and A. L. Williams. *Analyst*, July, pp. 377–383.

The determination of moisture by the volatile solvent method. J. M. Jones and T. McLachlan. *Analyst*, July, pp. 383–387.

ARTIFICIAL SILK.—The uses of artificial silk in the textile industry. P. E. King. *J. Soc. Dyers and Colourists*, July, pp. 213–219.

CEMENTS.—The control of components for magnesium oxychloride cements. *J.S.C.I.*, July 22, pp. 661–663.

DYEING.—The azoic colours; the production of insoluble azo dyes on the fibre. E. B. Higgins. *J. Soc. Dyers and Colourists*, July, pp. 213–219.

FERMENTATION.—Studies on the growth of yeast. IV. A nephelometric method of counting yeast suspensions. G. L. Peskett. *Biochem. J.*, No. 3, pp. 460–466.

The influence of fatty acids and hydroxy acids and their salts on alcoholic fermentation by living yeast. Part II. Propionic, butyric, isobutyric, lactic, hydroxyisobutyric, α, and β-hydroxybutyric acids and their sodium salts. H. Katagiri. *Biochem. J.*, No. 3, pp. 494–506.

INORGANIC.—A new scaly variety of aluminium hydroxide. P. Neogi and A. K. Mitra. *J. Chem. Soc.*, June, pp. 1222–1223.

ORGANIC.—The dicarbazyls. Part III. The oxidation of carbazole and *N*-alkylcarbazoles in acid solution. P. Maitland and S. H. Tucker. *J. Chem. Soc.*, June, pp. 1388–1391.

Aromatic sulphuryl disulphides. L. G. S. Brooker, R. Child, and S. Smiles. *J. Chem. Soc.*, June, pp. 1384–1387.

The purification and properties of insulin. F. Dickens, E. C. Doods, W. Lawson, and N. F. McLagan. *Biochem. J.* No. 3, pp. 560–571.

The chemistry of hexose diphosphoric acid. Part I. The α- and β-methylhexose diphosphoric acids. W. T. J. Morgan. *Biochem. J.*, No. 3, pp. 675–688.

PHYSICAL.—Selective solvent action. Part VI. The effect of temperature on the solubility of semi-solutes in aqueous alcohol. R. Wright. *J. Chem. Soc.*, June, pp. 1334–1336.

A study of the system carbonic acid, carbon dioxide, and water. (1) Determination of the time-dissociation constant of carbonic acid. F. J. J. Buytendyk, R. Brinkman, and H. W. Mook. *Biochem. J.*, No. 3, pp. 576–584.

A conductivity method for the determination of carbon dioxide. L. E. Bayliss. *Biochem. J.*, No. 3, pp. 662–664.

United States

ANALYSIS.—Estimation of methanol in alcohol and alcoholic beverages using the immersion refractometer. J. F. Willim. *Ind. Eng. Chem.*, July, pp. 844–846.

Titanous chloride for the determination of iron and of chloric acid. P. S. Brallier. *Ind. Eng. Chem.*, July, pp. 846–848.

Direct iodimetric determination of glucose. A. Voorhies and A. M. Alvardo. *Ind. Eng. Chem.*, July, pp. 848–850.

Detection of lactic acid in presence of other organic acids. F. G. Germuth. *Ind. Eng. Chem.*, July, pp. 852–854.

CELLULOSE.—Some factors in the copper number of cellulose. H. L. Gray and C. J. Stand. *Ind. Eng. Chem.*, July, pp. 854–855.

A hydrolysis number for wood cellulose. L. F. Hawley and L. C. Fleck. *Ind. Eng. Chem.*, July, pp. 850–852.

INORGANIC.—Illinium, the new rare earth. B. S. Hopkins. *J. Franklin Inst.*, July, pp. 1–11.

The geological distribution of iodine in the soils and natural waters of New Zealand. W. N. Benson and C. L. Carter. *Amer. J. Science*, July, pp. 39–47.

Influence of the reaction rate on operating conditions in contact sulphuric acid manufacture. W. K. Lewis and E. D. Ries. *Ind. Eng. Chem.*, July, pp. 830–836.

Nitric acid from ammonia. C. L. Parsons. *Ind. Eng. Chem.*, July, pp. 789–793.

ORGANIC.—The influence of solvent and concentration on the optical rotation of the pentacetates of glucose and mannose. P. A. Levenne and I. Bencowitz. *J. Biol. Chem.*, June, 679–694.

Catalytic reactions of ethylene. H. W. Walker. *J. Phys. Chem.*, July, pp. 961–996.

Phenol tests. IV. H. D. Gibbs. *J. Phys. Chem.*, July, 1053–1081.

The optical identification of the naphthalene sulphonic acids by means of their benzyl-pseudo-thiourea salts. R. M. Hann and G. L. Keenan. *J. Phys. Chem.*, July, pp. 1082–1090.

PETROLEUM.—Polymerisation and other chemical reactions in the sulphuric acid refining of cracked distillates. J. C. Morrell. *Ind. Eng. Chem.*, July, pp. 794–800.

Specific and sensible heats of petroleum oils. O. G. Wilson. *Ind. Eng. Chem.*, July, pp. 824–825.

PHYSICAL.—Equilibrium conditions in the formation of hydrocarbons and alcohols from water gas. D. F. Smith. *Ind. Eng. Chem.*, July, pp. 809–815.

The reactivity of coke. S. W. Parr and W. D. Staley. *Ind. Eng. Chem.*, July, pp. 820–822.

French

STARCH.—The technology of starch manufacture. P. Nottin. *Rev. Scientifique*, June 25, pp. 363–367.

CATALYSIS.—On the inversion of function of catalysts. P. Sabatier. *Comptes Rend.*, July 4, pp. 17–19.

Miscellaneous

ANALYSIS.—The estimation and separation of rare metals from other metals. Part IX. The quantitative separation of beryllium from aluminium. *Monatshefte für Chem.* June 30, pp. 113–122 (in German).

CATALYSIS.—On the negative catalysers for the hydrogenation of fatty oils. IV. Influence of impurities in the catalytic carriers. S. Ueno and T. Saidu. *J. Soc. Chem. Ind. Japan*, June, pp. 107–108 B (in English).

The decomposition of hydrogen peroxide solutions when catalysed by metallic ions. A. v.Kiss and E. Lederer. *Rec. Trav. Chim. Pays-Bas*, July, pp. 453–462.

GENERAL.—The densities of the system nicotine-water. N. Sata. *Bull. Chem. Soc. Japan*, May, pp. 139–143 (in German).

ORGANIC.—The action of chlorsulphonic acid on aromatic amines. O. Lustig and E. Katscher. *Monatshefte für Chem.*, June 30, pp. 87–98 (in German).

The course of Leuckart's xanthogenate reaction. J. Pollak, K. Deutscher, and M. Kraus. *Monatshefte für Chem.*, June 30, p. 102 (in German).

Diacylamines. Preparation of dipropionamide and di-isobutyramide. Formation of amidines. K. Brunner, R. Gruner, and Z. Benes. *Monatshefte für Chem.*, June 30, pp. 123–138 (in German).

The action of *p*-toluenesulphonamide on 1 : 4-dibrom-*n*-butane and a new synthesis of pyrrolidine. A. Müller and A. Sauerwald. *Monatshefte für Chem.*, June 30, pp. 155–162 (in German).

A study of the effect of some solvents on the yields of Grignard reagents. H. Gilman and R. McCracken. *Rec. Trav. Chim. Pays-Bas*, July, pp. 463–491 (in English).

Simultaneous diazotisation and nitration of aromatic amino compounds. I. J. Rinkes. *Rec. Trav. Chim. Pays-Bas*, July, pp. 506–509 (in English).

PHYSICAL.—The poisoning of hydrogen electrodes. I. A. H. W. Aten, P. Bruin, and W. de Langs. *Rec. Trav. Chim. Pays-Bas*, July, pp. 417–429 (in English).

The influence of neutral salts on acid salt equilibria. I. A contribution to the knowledge of the standard value used for calculating the exponent p_{H} of the hydrogen ion concentration. I. M. Kolthoff and W. Bosch. *Rec. Trav. Chim. Pays-Bas*, July, pp. 430–438 (in English).

The Hofmeister ion series. E. M. Buchner. *Rec. Trav. Chim. Pays-Bas*, July, pp. 439–444 (in English).

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

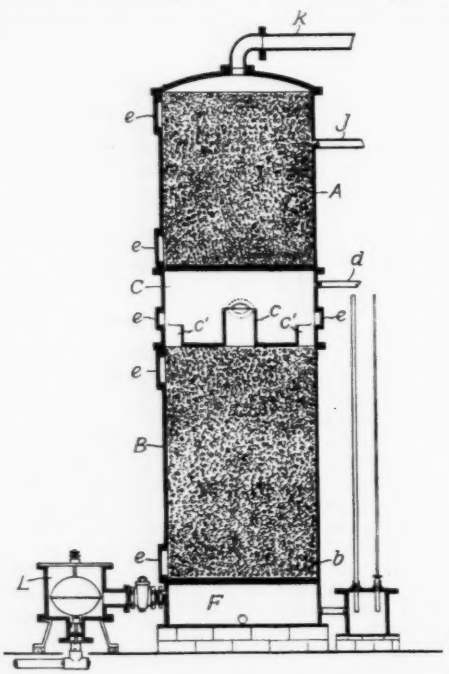
Abstracts of Complete Specifications

272,580. Azo Dyestuffs, Manufacture of. O. Y. Imray, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 9, 1926.

These new azo dyestuffs are obtained by combining a 3-nitro-4-diazo-1-phenolether, particularly the ethyl or methyl ether with an aceto-acetic acid anilide in which there is either an alkyl group in ortho position to the amino group, or an alkyloxy group in para position to the amino group. Suitable derivatives include the aceto-acetic acid orthotoluidide, the aceto-acetic acid para-anisidide, the aceto-acetic acid para-phenetidide, and their homologues or substitution products such as aceto-acetic acid asym-meta-xylidide, or aceto-acetic acid 2-chloro-4-anisidide; the latter substance is obtained by condensing aceto-acetic ester with 2-chloro-4-anisidine. In an example, 3-nitro-4-amino-1-phenol-ethyl ether is diazotised and run into an aqueous suspension of aceto-acetic acid orthotoluidide and sodium acetate. The dyestuff obtained is a yellowish-red powder. Other examples are given of the coupling of 3-nitro-4-amino-1-phenol-ethyl ether and aceto-acetic acid para-anisidide, 3-nitro-4-amino-1-phenol-methyl ether and aceto-acetic acid orthotoluidide, 3-nitro-1-methoxy-4-amino-benzene and aceto-acetic acid asym-meta-xylidine, 3-nitro-1-methoxy-4-amino-benzene and aceto-acetic acid-2-chloro-4-anisidide. The dyes are of great fastness to light.

272,641. Stills or Columns for the Distillation of Ammonia. W. T. Towler and R. Marsh, Riverbank Works, Sugar House Lane, Stratford, London, E.15. Application date, March 29, 1926.

In this apparatus, the usual superposed trays with bubbling hood and overflow pipes are not used, but packing material such as that described in Specification No. 139,880 (see The Chemical Age, Vol. II, p. 161) is used. The apparatus comprises upper and lower cylindrical compartments A, B, and intermediate compartment C, into which milk of lime is introduced through a pipe *d*. All compartments are provided with removable doors *e*. Steam is introduced into the lowest chamber F, and passes upwards through the perforated base plate *b* and the packing material in the compartment B to the tube *c* and middle compartment C. The steam then passes upwards through the compartment A in a similar manner. Ammonia liquor enters by pipe *j* and passes downward into the compartment C, where it mixes with the milk of lime and overflows into the pipes c^1 and the lower compartment B. The liquid is discharged through a float box L, and the gaseous ammonia is drawn off through a pipe *k*.



272,641

272,597. Recovery of Antimony in the Manufacture of Flavanthrone. E. C. R. Marks, London. From E. I. Du Pont de Nemours and Co., Wilmington, Del., U.S.A. Application date, March 15, 1926.

In the production of flavanthrone from β-aminoanthraquinone and antimony pentachloride in nitrobenzene solution the filtrate resulting from the removal of the colouring matter from the condensation charge is distilled to obtain a distillate containing a greater part of the antimony chloride and nitrobenzene, and some chloronitrobenzene. The distillate is treated with chlorine gas to convert the trichloride into pentachloride, and the mixture of antimony chloride and nitrobenzene can be used again in the manufacture of flavanthrone. About 80 to 85 per cent. of the nitrobenzene and antimony chloride are recovered so that some addition of fresh materials is necessary at each successive re-use. The amount of dry chlorine necessary is determined by analysis of the antimony trichloride present, and the temperature is kept below 50° C. during the treatment with chlorine.

272,686. Salts of Amino Guanidine, or Amino Alkylene Guanidines, Process for the Production of. M. Heyn, 15, Hobrechtufer, Breslau, Germany. Application date, June 18, 1926.

Salt of amino guanidine or aminoalkylene guanidines are obtained by the reaction of salts of the alkyl-isothioureas with aliphatic diamines or their hydrates. This reaction can be effected with all aliphatic diamines containing less than six carbon atoms. Examples are given of the reaction of tetra-methylene-diamine with methylisothio-urea sulphate to obtain amino-butylene guanidine sulphate (agmatin sulphate), methylisothio-urea sulphate with pentamethylene-diamine to obtain amino-pentylene guanidine sulphate.

272,733. Metal Compounds, Process of Producing. A. F. Meyerhofer, 10, Göthestrasse, Zurich, Switzerland. Application date, June 7, 1926. Addition to Specification No. 253,150.

Specification No. 253,150 (see The Chemical Age, Vol. XV, p. 209) describes a process in which barium silico-fluoride is heated to obtain barium fluoride and silicon fluoride. The barium fluoride is treated with an oxide or salt whose base yields a sparingly soluble fluoride. The latter and the silicon fluoride are treated with acid to obtain hydrofluo-silicic acid which is used to reproduce the barium fluoride. The process is particularly suitable for preparing barium peroxide by first preparing barium hydroxide or nitrate. In the present invention, the hydrofluosilicic acid is not used directly to reproduce barium silico-fluoride but to produce lead, potassium, or copper silico-fluoride. Barium silico-fluoride is then obtained by double decomposition with a barium salt. A compound of a metal other than barium is thus obtained as a by-product.

272,748. Alumina, Process for the Production of. A. L. Mond, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 20, 1926.

Clay is dissolved in hydrochloric acid and the silicic acid is separated from the alumina-iron solution by filtration. The salts are evaporated to dryness and then heated to volatilise the acid anhydrides which may be recovered for use again. The metal oxides obtained are free from silicic acid and are heated with carbon in an electric furnace until they are

decomposed into alumina and metallic iron, and an easily separated metallic regulus is formed. The process can be applied to other substances containing alumina, such as bauxite, leucite, or phonolite. In the case of bauxite, sulphuric acid is usually employed, but it must be diluted so that the titanic acid is completely separated. If the mixture of oxides obtained contains alkalies, these may be dissolved out as chlorides or sulphates. The silicic acid is obtained in a form which can be used in the cement industry.

273,017. TITANIUM-CONTAINING PIGMENTS, PRODUCTION OF. F. G. C. Stephens, L. J. Anderson, and W. A. Cash, National Metal and Chemical Bank, Ltd., Adelaide House, King William Street, London, E.C.4. Application date, March 26, 1926.

The object is to obtain titanium pigments of great covering power and whiteness. In preparing the pigment ground ilmenite is treated with concentrated sulphuric acid, filtered, diluted, and alkaline earth sulphate added, and the mixture boiled to precipitate hydrated titanium oxide on the sulphate. The mixture is filtered, and the residue suspended in water and neutralised with barium or calcium carbonate. Calcium or barium borate in the proportion of 2–4 per cent. of the titanium oxide is then intimately mixed with the suspension, which is then filtered, dried, and heated to 700°–900° C. A larger proportion of the borate may be employed.

273,029. ARTIFICIAL INDIARUBBER, PROCESS FOR THE MANUFACTURE OF. V. Villa, 13, Rue de Coulmiers, Paris. Application date, April 1, 1926.

Vegetable or animal oils are treated with sulphur chloride in the presence of a catalyst consisting of depolymerised artificial indiarubber freed from chlorine. The operation is conducted out of contact with air at a temperature of 0°–15° C. The resulting rubber contains only a small proportion of sulphur chloride, and hydrochloric or sulphuric acid is not formed. To obtain the catalyst, some of the artificial rubber is dissolved in benzol or sulphur chloride at a temperature above 40° C., whereby the chlorine is eliminated and a viscous depolymerised substance is obtained. An example of the artificial rubber consists of crude colza oil 75–85 per cent., catalyst 3–8 per cent., sulphur chloride 6–8 per cent., with any desired proportion of filling material. The mixture may be moulded, and the reaction takes place in the mould and is complete after several hours.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 246,870 (I.G. Farbenindustrie Akt.-Ges.), relating to dry diazo preparations, see Vol. XIV, p. 362; 249,493 and 251,264 (I.G. Farbenindustrie Akt.-Ges.), relating to liquid hydrocarbons from coal, oils, etc., see Vol. XIV, p. 550, and Vol. XV, p. 59; 249,549 (Soc. of Chemical Industry in Basle), relating to dyestuff preparations, see Vol. XIV, p. 551; 253,562 (Chemical Research Syndicate, Ltd.), relating to cracking hydrocarbon oils, see Vol. XV, p. 210; 255,819 (Silica Gel Corporation), relating to adsorption apparatus, see Vol. XV, p. 331; 258,846 (Allgemeine Ges. für Chemische Industrie), relating to purification of liquid hydrocarbons, see Vol. XV, p. 528; 261,707 (I.G. Farbenindustrie Akt.-Ges.), relating to splitting fats and oils, see Vol. XVI, p. 121; 262,155 (Chemische Fabrik auf Actien, vorm. E. Schering), relating to symmetrical diarylguanidines, see Vol. XVI, p. 167; 269,212 (I.G. Farbenindustrie Akt.-Ges.), relating to diazo salts and preparations, see Vol. XVI, p. 416.

International Specifications not yet Accepted

271,451. CRACKING OILS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 20, 1926. Addition to 268,796. (See THE CHEMICAL AGE, Vol. XVI, p. 559.)

Crude mineral oil trickles down through a column lined with sheet cobalt, and filled with copper permutit heated to 400° C. Hydrogen or steam is passed through in the same direction. The effluent gas is condensed yielding 20–30 per cent. of liquid boiling up to 175° C., while the effluent liquid comprising 70–80 per cent. is an oil boiling up to 300° C.

271,452. HYDROCARBONS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 22, 1926. Addition to 267,554. (See THE CHEMICAL AGE, Vol. XVI, p. 515.)

Catalysts for the production of hydrocarbons, etc., from oxides of carbon and hydrogen consist of iron, cobalt, nickel, or molybdenum, obtained by thermal decomposition of the carbonyl. The resulting fine powder may be used, or it may be deposited on active silica; the metal is preferably used in the form of flakes obtained by decomposing the carbonyl vapour as described in specification 269,677. (See THE CHEMICAL AGE, Vol. XVI, p. 534.) The oxides obtained by burning the carbonyl may also be employed. Hydrocarbons for fuel, solvent, and lubricating purposes can be obtained by passing carbon monoxide and hydrogen over iron flakes heated to 250° C. The catalyst is periodically withdrawn and fresh catalyst formed by passing iron carbonyl vapour into the reaction chamber at a higher temperature.

271,474. WETTING AND EMULSIFYING AGENTS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 19, 1926.

These products are obtained by sulphonating a mineral oil, other than coal tar oil, and aromatic or hydroaromatic hydrocarbons or derivatives. Solar oil, yellow oil, gas oil, paraffin oil and hydrocarbons obtained from brown coal tar and shale tar oil can be sulphonated together with benzene, xylene, solvent naphtha, naphthalene, anthracene, tetrahydronaphthalene, chlorbenzene and chlornaphthalene.

271,482. AMMONIA SYNTHESIS. K. Müller, West Lichterfelde, Berlin. International Convention date, May 19, 1926.

A catalyst for ammonia synthesis consists of iron carbide, employed at temperatures below 450° C., or mixed with metallic oxides or hydroxides or sulphides to avoid decomposition. The catalyst becomes more efficient in use, and this can be accelerated by adding cyanogen compounds of alkaline earth or alkali metals, particularly potassium.

271,483 and 271,491. HYDROGEN AND CARBON. R. Battig, Sodingen, Westphalia, Germany. International Convention date, May 20, 1926.

271,483. Methane is passed over heated brickwork and then into a chamber having a baffle wall, where carbon is deposited. The hydrogen then passes through another chamber containing brickwork, which becomes heated. The methane supply is then stopped, and air passed through the last chamber in the opposite direction and thence to the baffle chamber where the carbon deposit is burned. The carbon dioxide then passes through the first brickwork chamber to heat it, and the cycle is recommenced with methane.

271,491. Cannel or lignite coal, wood, cellulose, or other carbonaceous material is coked, and the gases partly liquefied to separate hydrogen. The liquid is fractionated to obtain methane, which is then passed over coke heated to 1000° C. or through the coke ovens, where it is decomposed into hydrogen and carbon, the latter being deposited on the coke. The hydrogen is freed from methane by partial liquefaction.

271,523. HYDROGEN AND METHYL ALCOHOL. R. J. A. Grenier, 3, Avenue Girardot, Montmorency, Seine-et-Oise, France. International Convention date, May 22, 1926.

Wood charcoal is employed as a catalyst in the production of hydrogen from carbon monoxide and steam, or the production of methyl alcohol from carbon monoxide and hydrogen.

271,816. FLUORIDES AND SILICOFLUORIDES. Rütgerswerke Akt.-Ges., 43, Hardenbergstrasse, Charlottenburg, Berlin. International Convention date, May 31, 1926.

Natural fluorides are treated with acids, and the gases treated with a suspension of alumina, kaolin or a substance containing alumina to obtain aluminium fluoride and precipitate silicic acid hydrate. If soda is employed as an absorbent, sodium fluoride and fluosilicate are obtained.

271,818–9. VANILLIN. R. H. Bots and Soc. Anon Produits Chimiques Coverlin, 66, Marche aux Chevaux, Antwerp, Belgium. International Convention date, May 25, 1926.

271,818. Eugenol or oil of cloves is heated with caustic potash without an organic solvent or in presence of excess of aniline to obtain *i*-eugenol. Caustic soda is added, and the mixture heated and some aniline distilled off. Nitrobenzene is then added and the mixture heated. Vanillin is then extracted, precipitated and purified.

271,819. Eugenol is converted into *i*-eugenol by heating with caustic potash in the presence of aniline, *o*-toluidine, or

o-anisidine. Thus, oil of cloves is heated with caustic potash, and after the terpenes have distilled, aniline or *o*-toluidine is added and the mixture heated. Excess of caustic potash is drawn off, and the liquid cooled and treated with nitrobenzene and caustic soda to obtain vanillin.

271,828. CONCENTRATING VOLATILE ALIPHATIC ACIDS. Holzverkohlungs-Industrie Akt.-Ges., Konstanz, Baden, Germany. International Convention date, May 25, 1926. Addition to 271,044.

Specification 271,044 (See THE CHEMICAL AGE, Vol. XVII, p. 86), describes a process for concentrating raw pyroligneous acid, and this is now combined with a purifying or esterifying process. Pyroligneous acid containing 10 per cent. of acetic acid and 4 per cent. of methyl alcohol is saturated with sodium bisulphate, and the oily and tarry matter removed. Methyl acetate is formed on heating, and is obtained on distillation, together with most of the acetic acid in concentrated form.

271,837. SYNTHETIC DRUGS. Etablissements Poulenc Frères Soc. Anon., 86, Rue Vieille-du-Temple, Paris. International Convention date, May 25, 1926.

C:C-dialkyl- or -arylalkyl-barbituric acids are treated with a primary or secondary amine derived from ethanol, *e.g.*, ethanol-amine, diethanolamine, or diethylaminoethanol in the presence of water. Examples are given.

LATEST NOTIFICATIONS.

274,425. Process for protecting materials from moth. I. G. Farbenindustrie Akt.-Ges. July 13, 1926.

274,439. Process for the manufacture of alkylated phenols and their hydrogenated products. Chemische Fabrik auf Actien (vorm. E. Schering). July 14, 1926.

274,462. Operation of internal-combustion engines. I. G. Farbenindustrie Akt.-Ges. July 13, 1926.

274,465. Method of producing high-value oils from raw coal by low temperature distillation and hydrogenation. Feige, R. July 16, 1926.

274,488. Process for the manufacture of crotonic aldehyde and its homologues. Soc. Anon. Distilleries Des Deux-Sevres. July 14, 1926.

274,492. Catalysers for the synthesis of alcohols. Soc. Anon. Compagnie De Bethune. July 17, 1926.

274,501. Manufacture of condensation products of arylamines. Haller, P., and Kappeler, H. July 16, 1926.

Specifications Accepted with Date of Application

249,147. Halogen-dibenzpyrene-quinones, Manufacture of. I. G. Farbenindustrie Akt.-Ges. March 14, 1925.

250,251. Vat-dyestuff preparations, Manufacture of. Soc. of Chemical Industry in Basle. April 2, 1925.

250,577. Heterocyclical arsenic compounds, Process for the production of. Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler. April 11, 1925.

255,905. Hydrocarbons, Purification of. I. G. Farbenindustrie Akt.-Ges. July 27, 1925.

256,243. 3:4-benziminazolone-arsinic acids, Manufacture of. I. G. Farbenindustrie Akt.-Ges. July 31, 1925.

273,841. Sulphur from the sulphates of earth alkalies, Process for obtaining. Salzwerk Heilbronn Akt.-Ges., T. Lichtenberger, and K. Flor. April 16, 1926. Addition to 251,942.

259,560. Casting tungsten carbide and other alloys having very high melting points, Method and device for. A. Brennecke. October 7, 1925.

261,344. Furnaces for the treatment of zinc ores. A. Roitzheim and W. Remy. November 13, 1925.

262,408. Production of solid ammonium carbonate from its components, Process for. Rhenania Kunheim Verein Chemische Fabriken Akt.-Ges. December 7, 1925.

263,877. Catalytic dehydrogenations. I. G. Farbenindustrie Akt.-Ges. January 4, 1926. Addition to 262,120.

265,162. Complex ores and metallurgical products, Processes for working up. F. Krupp Grusonwerk Akt.-Ges. January 26, 1926.

266,729. Carbonic acid gas content in gases, Method of reducing to carbon monoxide. F. M. Wiberg. February 27, 1926.

268,817. Alkali bisulphate, Manufacture of. I. G. Farbenindustrie Akt.-Ges. April 1, 1926.

273,776. Aldol and croton aldehyde from acetaldehyde, Manufacture of. O. Silberrad. November 15, 1926.

273,779. Metallurgical furnace plant. B. Talbot. March 5, 1926.

273,781. Petroleum oils, Cracking of—and the carburetting of water gas. Petroleum Chemical Corporation and E. P. Stevenson. March 24, 1926.

273,788. Imparting a close texture to metals, Process and apparatus for. N. N. Jarotzky. April 1, 1926.

273,832. Ozonides of hydrocarbons and process of making the same. A. S. Ramage. April 13, 1926.

273,883. Ferric sulphate, Manufacture of. B. Hart, Harris, Hart, and Co., Ltd., and Refiners, Ltd. June 12, 1926.

273,923. Aromatic amines and derivatives thereof, Process for preparing. British Dyestuffs Corporation, Ltd., R. W. Everatt, and E. H. Rodd. August 25, 1926.

273,976. Roasting fine sulphide ores and the like. Processes of, A. L. Mond. (*Metallbank und Metallurgische Ges. Akt.-Ges.*) January 21, 1927.

273,999. Converting high boiling hydrocarbons which have been freed from the substances soluble in liquid sulphurous acid into low boiling hydrocarbons, Process for—by means of aluminium chloride. Allgemeine Ges. für Chemische Industrie. September 17, 1926. Addition to 272,433.

252,320. Electrolytic process and apparatus. H. C. Harrison. May 21, 1925.

258,219. Electro-plating with chromium, Process for. Chromium Products Corporation. September 10, 1925.

Applications for Patents

Anderson, I. B., Scottish Dyes, Ltd., Thomas, J., and Thomson, R. F. Production of benzanthrone derivatives. 19,315. July 20.

Anderson, I. B., Scottish Dyes, Ltd., Thomas, J., and Thomson, R. F. Production of dyestuffs. 19,514. July 22.

Appel, R. Process for electrolytic separation of metallic chromium. 19,293. July 20. (Germany, July 21, 1926.)

Bader, W., British Celanese, Ltd., and Dreyfus, H. Manufacture of aliphatic compounds. 19,597, 19,598. July 23.

Binz, A., and Räth, C. Production of nitropyridine arsinic-acids. 19,071. July 18. (Germany, August 5, 1926.)

Boistel, M., Hugel, G., and Paul, M. Manufacture of catalysts, etc. 18,997. July 18. (Germany, February 28.)

British Celanese, Ltd., Ellis, G. H., and Kirk, E. W. Treatment of materials containing cellulose derivatives. 19,118, 19,155. July 19.

British Celanese, Ltd., Ellis, G. H., and Kirk, E. W. Treatment of materials containing cellulose derivatives. 19,222, 19,252. July 20.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs. 19,066, 19,067. July 18.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Distillation, etc., process. 19,316. July 20.

Coley, H. E., and Kekwick, L. O. Productions of hydrocarbons. 19,368. July 21.

Coley, H. E., and Kekwick, L. O. Production of zinc white. 19,503. July 22.

Dreyfus, H. Production of solutions, etc., of cellulose esters, etc. 19,364. July 21.

Geigy, Akt.-Ges., J. R. Manufacture of azo dyestuffs. 19,493. July 22. (Germany, July 29, 1926.)

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Desizing processes. 18,995. July 18. (January 18, 1926.)

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Process for recovery of sodium nitrate. 19,373. July 21.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of viscous oils. 19,374. July 21.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Oxidising paraffins, etc. 19,501. July 22.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of nitrogenous dyestuffs. 19,605. July 23.

I. G. Farbenindustrie Akt.-Ges. Dehydration of moist fuel. 18,996. July 18. (Germany, July 21, 1926.)

I. G. Farbenindustrie Akt.-Ges. Production of liquid hydrocarbons, etc. 19,279. July 20. (March 13, 1926.)

I. G. Farbenindustrie Akt.-Ges. Process for opening-up materials containing cellulose. 19,424. July 21. (Germany, July 21, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of carboxylic acids of acenaphthene. 19,492. July 22. (Germany, July 24, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of derivatives of acenaphthene. 19,602. July 23. (Germany, July 24, 1926.)

Imperial Chemical Industries, Ltd., and Austin, E. L. Folding, etc. boxes. 19,177. July 19.

Imperial Chemical Industries, Ltd., and Austin, E. L. Air cleaners for internal-combustion engines. 19,355. July 21.

Soc. des Etablissements Barbet. Extraction of glycerine. 19,203. July 19. (France, July 19, 1926.)

Soc. L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. Processes for carrying out exothermic catalytic chemical reactions. 19,049. July 18. (France, April 30.)

Soc. L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. Processes for carrying out exothermic chemical reactions. 19,187. July 19. (France, August 9, 1926.)

Suida, H. Process for recovering concentrated acetic acid from dilute acetic acid. 19,074. July 18.

Suida, H. Process for recovering concentrated acetic acid from dilute acetic acid. 19,544. July 22. (Austria, November 6, 1926.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton for home market, 1-cwt. drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—8d. to 9d. per lb. Crude 60's, 2s. 4½d. to 2s. 8d. per gall.

ACID CRESYLIC 99/100.—2s. 8d. to 2s. 9d. per gall. 97/99.—2s. 1½d. to 2s. 4½d. per gall. Pale, 95%, 2s. to 2s. 3d. per gall. Dark, 1s. 9d. to 2s. 1d. per gall.

ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOLE.—Crude 65's, 11d. to 1s. per gall., ex works in tank wagons. Standard Motor, 1s. 9d. to 2s. 2d. per gall., ex works in tank wagons. Pure, 1s. 7d. to 2s. 3d. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 8d. to 1s. 10½d. per gall. Firm. Pure, 2s. to 2s. 3½d. per gall.

XYLOL.—2s. to 2s. 4d. per gall. Pure, 2s. 5d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6¾d. to 8¼d.; middle oil, 7¾d. to 7¾d. per gall. Heavy, 8⅜d. to 8⅞d. per gall. Salty, 7d. per gall. less 1½%.

NAPHTHA.—Crude, 7½d. to 8d. per gall. according to quality. Solvent 90/160, 1s. 2d. to 1s. 6d. per gall. Solvent 95/160, 1s. 5d. to 1s. 6d. per gall. Solvent 90/190, 11d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £7 10s. per ton. Whizzed or hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £13 10s. per ton. Quiet. Flaked, £12 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 80s. to 87s. 6d. per ton, f.o.b., according to district; nominal.

PYRIDINE.—90/140, 7s. to 13s. per gall. Nominal. 90/180, 4s. 6d. to 5s. per gall. Heavy, 5s. to 8s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—4s. 9d. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—1s. 6d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7½d. per lb. naked at works.

ANILINE SALTS.—7½d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—4½d. per lb. Fair inquiry.

m-CRESOL 98/100%.—2s. 7½d. per lb. Only limited inquiry.

p-CRESOL 32/34° C.—2s. 8½d. per lb. Only limited inquiry.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb. d/d.

R. SALT.—2s. 2d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—7½d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

N. W. Acid.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 10s. to £9 5s. per ton. Grey, £15 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£6 15s. to £10 per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall. 16° Tw.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 9d. to 4s. per gall., 60% O.P. Solvent, 3s. 11d. to 4s. 3d. per gall., 40% O.P.

WOOD TAR.—£4 to £5 10s. per ton and upwards, according to grade.

BROWN SUGAR OF LEAD.—£40 15s. to £41 10s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 6d. per lb.

ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. to 1s. 3d. per oz., according to quantity.

ACID, BORIC B.P.—5 cwt. lots Crystal, 41s. per cwt.; powder, 45s. per cwt. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 7¾d. to 1s. 10d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P.—1s. 3d. to 1s. 6d. per lb.; Technical.—11¼d. to 1s. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 3¾d. per lb., less 5%. Firm market.
AMIDOL.—9s. per lb., d/d.
ACETANILIDE.—1s. 6d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—8s 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: 1s. per lb.
ATROPINE SULPHATE.—11s. per oz. for English make.
BARBITONE.—6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. to 10s. per lb.
BISMUTH CITRATE.—9s. 6d. to 9s. 9d. per lb.
BISMUTH SALICYLATE.—8s. 9d. to 9s. per lb.
BISMUTH SUBNITRATE.—7s. 9d. to 8s. per lb.
BISMUTH NITRATE.—5s. 9d. to 6s. per lb.
BISMUTH OXIDE.—13s. 9d. to 14s. per lb.
BISMUTH SUBCHLORIDE.—11s. 9d. to 12s. per lb.
BISMUTH SUBGALLATE.—7s. 9d. to 8s. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb.; 36 W. Qts. 11¼d. per lb.
BORAX B.P.—5 cwt. lots, Crystal, 25s. per cwt.; powder, 27s. per cwt. according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Potassium, 1s. 11d. per lb.; sodium, 2s. 4d. per lb.; ammonium, 2s. 4d. per lb.; granulated ½d. per lb. less; all spot.
CALCIUM LACTATE.—1s. 3¼d.
CHLORAL HYDRATE.—3s. 6d. per lb., duty paid.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—Prices for Winchester quarts; dozen Winchester quarts; carboys or drums; and 10 cwt. lots respectively: ·730—1s. 2½d.; 1s. 2d.; 1s. 1½d.; 1s. 0½d.; ·720 technical—1s. 5½d.; 1s. 5d.; 1s. 4½d.; 1s. 3½d.; ·720 pur. (Aether B.P., 1914)—2s. 4d.; 2s. 3½d.; 2s. 3d.; 2s. 2d.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—5s. per lb.
HEXAMINE.—2s. 4d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 1 lb., 16s. per doz.; ½ lb., 9s. 6d. per doz.; ¼ lb., 6s. 6d. per doz.
HYDROQUINONE.—2s. 11d. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.
IRON PERCHLORIDE.—4d. per lb., 22s. per cwt.
MAGNESIUM CARBONATE.—Light Commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy Commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 18s. 6d. per lb. net; Synthetic detached crystals, 11s. 6d. to 14s. 6d. per lb., according to quantity; Liquid (95%), 12s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10d. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 9d. per lb.
METHYL SULPHONAL.—9s. 6d. to 9s. 9d. per lb.
METOL.—11s. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—2s. 9d. to 3s. per lb.
PHENAZONE.—4s. 3d. to 4s. 6d. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—100s. per cwt. less 2½% for ton lots.
POTASSIUM CITRATE.—B.P.C., 1911: 1s. 8d. to 1s. 11d. per lb.; U.S.P.: 1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 6d. per lb., spot.
QUININE SULPHATE.—2s. per oz., 1s. 8d. for 1000 oz. lots in 100 oz. tins.
RESORCIN.—3s. 9d. to 4s. per lb., spot.
SACCHARIN.—55s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923—2s. per lb. for 1 cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 97s. 6d. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 9d. to 1s. 10d. per lb. Crystal, 1s. 10d. to 1s. 11d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
SULPHONAL.—6s. 6d. to 6s. 9d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. to 2s. 2d. per lb.
THYMOL.—Puriss., 10s. 6d. to 10s. 9d. per lb., according to quantity. Firmer. Natural, 15s. per lb.

Perfumery Chemicals

ACETOPHENONE.—6s. 6d. per lb.
AUBEPINE (EX ANETHOL), 10s. 6d. per lb
AMYL ACETATE.—2s. per lb.
AMYL BUTYRATE.—5s. 3d. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—17s. per lb.
COUMARIN.—10s. per lb.
CITRONELLOL.—13s. 9d. per lb.
CITRAL.—8s. 6d. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. per lb.
GERANIOL (PALMAROSA).—18s. 6d. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. 6d. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 18s. 6d. per lb. Ex Shui Oil, 14s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—8s. 6d. per lb.
NEROLIN.—4s. 6d. per lb.
PHENYL ETHYL ACETATE.—12s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—32s. 6d. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 8d. per lb.
VANILLIN.—17s. to 18s. per lb.

Essential

ALMOND OIL.—11s. per lb.
ANISE OIL.—3s. per lb.
BERGAMOT OIL.—28s. per lb.
BOURBON GERANIUM OIL.—14s. 6d. per lb.
CAMPHOR OIL.—70s. per cwt.
CANANGA OIL, JAVA.—26s. per lb.
CINNAMON OIL LEAF.—6d. per oz.
CASSIA OIL, 80/85%.—7s. 6d. per lb.
CITRONELLA OIL.—Java, 85/90%, 1s. 11d. per lb. Ceylon, pure, 1s. 9d. per lb.
CLOVE OIL.—6s. per lb.
EUCALYPTUS OIL, 75/80 %.—2s. 3d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 22s. 6d. per lb.
LEMON OIL.—8s. per lb.
LEMONGRASS OIL.—4s. 6d. per lb.
ORANGE OIL, SWEET.—10s. 6d. per lb.
OTTO OF ROSE OIL.—Anatolian, 30s. per oz. Bulgarian, 70s. per oz.
PALMA ROSA OIL.—10s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 18s. per lb. Japanese, 8s. per lb.
PETITGRAIN OIL.—7s. 9d. per lb.
SANDALWOOD OIL.—Mysore, 26s. 6d. per lb.; 90/95%, 15s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, July 28, 1927.

WITH the approach of the August Holiday, trade is naturally somewhat quiet and there is very little of interest to report. Prices on the whole continue steady. Export trade is only fair.

General Chemicals

ACETONE.—The price is unchanged at round about £62 per ton ex store.

ACETIC ACID.—The market is fairly active at £37 to £38 per ton for 80% grade.

ACID CITRIC.—A fair market is reported at 1s. 8d. per lb. less 5%.

ACID FORMIC is extremely firm and the demand is fair at £47 per ton for 85%.

ACID LACTIC is only in fair request but the price is unchanged at £42 to £43 per ton for 80% by weight for high grade pale quality.

ACID OXALIC.—The price has advanced and the market now stands at £30 to £32 per ton with a fair demand.

ALUMINA SULPHATE is in fair request at £5 10s. per ton for 17/18%.

AMMONIUM CHLORIDE.—A fair business is reported and the market is unchanged at £19 per ton.

ARSENIC is unchanged.

BARIUM CHLORIDE still continues inactive but the price is quoted at £9 per ton on the spot.

COPPER SULPHATE is a fair market, for the time of the year, at about £23 to £23 10s. per ton.

FORMALDEHYDE is a strong market at £40 to £41 per ton.

LEAD ACETATE is also strong and the demand is good at £43 per ton for white and £1 per ton less for brown.

LEAD NITRATE is unchanged at £39 per ton, with a fair demand.

METHYL ACETONE is very firm and scarce at about £62 per ton.

POTASSIUM CHLORATE is unchanged.

POTASSIUM PERMANGANATE is firm and a good business is passing at 7¼d. per lb.

POTASSIUM PRUSSIATE is somewhat quiet at £60 to £63 per ton, according to quantity; demand small.

SODIUM ACETATE has been in better request and the price is firm at from £18 15s. to £19 5s. per ton.

SODIUM BICHROMATE is unchanged.

SODIUM CHLORATE.—A fair business is reported at about 2¾d. per lb.

SODIUM HYPOSULPHITE is unchanged at British makers' figures; demand small.

SODIUM NITRITE.—There has been a fair request and the price is firm at £19 10s. to £20 per ton.

SODIUM PHOSPHATE is active at £12 10s. to £13 per ton.

SODIUM PRUSSIATE.—This market is quiet at 4¼d. per lb.

SODIUM SULPHIDE is quiet and the price unchanged.

ZINC SULPHATE.—A fair business is reported at round about £14 per ton.

Coal Tar Products

The market values of coal tar products in carbolic have a certain firmness, but in Benzol and solvent there is very little inquiry.

90's BENZOL.—There is practically no demand, and it is quoted at 1s. 2½d. to 1s. 3d. per gallon on rails, while the motor quality can be bought at about 1s. 2d. per gallon.

PURE BENZOL is quoted about 1s. 8d. to 1s. 9d. per gallon on rails.

CREOSOTE OIL is firmer for delivery over the next two months, the price on rails in the north being 7½d. per gallon, while the price in London is 8½d. to 8¾d. per gallon.

CRESYLIC ACID remains very firm. The pale quality 97/99% is very scarce for early delivery. It is quoted at 2s. 4½d. to 2s. 5½d. per gallon on rails, while the dark quality is worth about 2s. per gallon on rails.

SOLVENT NAPHTHA.—There is practically no demand. It could be easily bought at 10d. to 10½d. per gallon on rails.

HEAVY NAPHTHA.—Very little business. The price remains unchanged at about 11d. per gallon on rails.

NAPHTHALENES.—Very little business for the crude quality. For the 74/76 quality, prices tend to become firmer, at about £6 10s. to £6 15s. per ton. The 76/78 quality remains firm at about £8 to £8 10s. per ton, but supplies are scarce for the next few months.

PITCH is unchanged. There is very little demand and prices remain unchanged at 80s. to 85s. per ton, f.o.b. U.K. ports.

Latest Oil Prices

LONDON, July 27.—LINSEED OIL in quiet request at irregular prices. Spot, ex mill, £32 15s.; July, £31 10s.; August, £31 12s. 6d.; September-December, £32 2s. 6d.; January-April, £32 10s. RAPE OIL inactive. Crude, extracted, £42 10s.; technical, refined, £44 10s., naked, ex wharf. COTTON OIL quiet. Refined common, edible, £40; Egyptian, crude, £34; deodorised, £42. TURPENTINE firm at 9d. advance. American, spot and August, 44s. 6d.; September-December, 46s.

HULL.—LINSEED OIL.—Spot and July, £32 12s. 6d.; August, £32 10s.; September-December, £32 7s. 6d. COTTON OIL.—Egyptian, crude, £33 15s.; edible, refined, £37 15s.; technical, £37 5s.; deodorised, £39 15s. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., £37. GROUNDNUT OIL.—Crushed, extracted, £43; deodorised, £47. SOYA OIL.—Extracted and crushed, £33 5s.; deodorised, £36 15s. RAPE OIL.—Crude, extracted, £42 10s.; refined, £44 10s. per ton, net, cash terms, ex mill.

Nitrogen Products

Home.—British producers have not yet announced the home prices for the season 1927-28, and it is reported that they have deferred this announcement as late as possible on account of a shortage of supplies for near delivery. The usual seasonal decline in production will be more than made up by the vast expected increase of synthetic production, so that ample supplies should be available for all requirements before the season is at its height. Under these circumstances, and in view of low prices at which other nitrogenous fertilisers are selling, it is expected that the cut in price will be exceptionally large.

Export.—Most of the producing countries are now selling on about the equivalent of £9 2s. 6d., f.o.b. U.K. port in single bags, and purchases at about these figures have been large. These low prices have stimulated demand enormously in European countries as well as in the Far East. The West Indies and South American countries have also been buyers. It is expected that prices will be advanced gradually until the peak is reached in February-April.

Nitrate of Soda.—The offering of large quantities of sulphate of ammonia at the lower prices mentioned above has resulted in a small drop in the nitrate market. Nitrate producers are now accepting 16s. 3d. to 16s. 6d. per metric quintal, f.a.s. Chile, for spot delivery. As early requirements of nitrate seem all to be covered, there is now a lull in buying. We have had no further news from Chile concerning production.

Benzol Prices

A CORRESPONDENT writes: In a recent issue of THE CHEMICAL AGE the price quoted for pure benzol ranged from 1s. 7d. to 2s. 6d. per gallon. I consider that this differential is of too wide a range to quote. The following, in my opinion, would be a fair indication of the market prices to-day:—Crude benzol, 65%, 9d. to 10d. per gallon; standard motor benzol, 1s. 2d. to 1s. 3d. per gallon; pure benzol, 1s. 6d. to 1s. 8d. per gallon; in all cases ex works in tank wagons.

[The explanation offered ot the wide variation referred to by our correspondent is that provincial traders quote the higher prices and London dealers the lower prices.—ED. C.A.]

Canadian Nickel Production: Revised Figures for 1926

FINALLY revised statistics on nickel production in Canada during 1926, as reported by the Mining, Metallurgical, and Chemical Branch of the Dominion Bureau of Statistics, show an output of 65,714,294 lb., valued at $14,374,163, as compared with 73,857,114 lb., valued at $15,946,672 in 1925. These figures include the nickel in matte exported by the Mond Nickel Co., Ltd., and the International Nickel Co., of Canada, Ltd., at 18 cents per lb.; refined and electrolytic nickel, nickel in nickel oxide and nickel salts, nickel metal and nickel contained in speiss residues exported.

The International Nickel Co. refines smelter matte containing about 80 per cent. copper nickel, the resulting products being electrolytic nickel, refined nickel, oxide, salts, converter copper and residues containing precious metal which are exported for further refining.

This company exports matte to the United States for the manufacture of Monel metal. The Mond Nickel Co., of course, ships matte to Wales for refining. The total quantity of nickel exported from Canada in 1926 amounted to 63,875,800 lb., valued at $12,460,884.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, July 27, 1927.

BUSINESS in the heavy chemical market still remains quiet, but with a renewal of consumption during this week. More activity is looked for in the near future. Prices remain at about the same level as last reported with the exception of arsenic which is appreciably higher.

Industrial Chemicals

ACID ACETIC.—98/100%, £65 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton. Powder, £36 per ton packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In moderate demand and price unchanged at 8d. per lb., f.o.b. U.K. ports.

ACID CITRIC B.P. CRYSTALS.—Quoted 1s. 7d. per lb., less 5%, ex store, for English material. Continental on offer at 1s. 8d. per lb., less 5%, c.i.f. U.K. ports.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. 9d. per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC, 80°.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC.—Still in good demand and price unchanged at 3d. per lb., ex store, spot delivery. Offered from the Continent at 2¾d. per lb., ex wharf.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In moderate demand and price unchanged at 1s. 4d. per lb., ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material quoted £5 12s. 6d. per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM POTASH.—Lump quality on offer from the Continent at £8 2s. 6d. per ton, c.i.f. U.K. ports; powdered, 2s. 6d. per ton less; lump on spot on offer at £9 2s. 6d. per ton, ex store.

AMMONIA ANHYDROUS.—Unchanged at about 9d. per lb. carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2¼d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of English manufacture quoted £23 to £24 per ton, ex station. Continental on offer, £19 10s. per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £17 15s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—In good demand and price advanced to about £18 15s. per ton, ex wharf. Prompt despatch from mines. Spot material available at £19 5s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £7 2s. 6d. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers, £8 per ton, ex station, minimum 4-ton lots. Spot material, 10s. per ton extra. Continental on offer at £7 5s. per ton, ex wharf.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton: powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 to £5 5s. per ton, ex station, with a slight concession for contracts. Continental quoted £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER SULPHATE.—Continental material now quoted £23 15s. per ton, ex wharf. British material on offer at £23 10s. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Unchanged at £38 per ton, c.i.f. U.K. ports, spot material quoted £39 5s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material unchanged at £31 15s. per ton, ex store.

LEAD, WHITE.—Quoted £32 5s. per ton, ex store.

LEAD ACETATE.—White crystals offered from the Continent at £42 7s. 6d. per ton, c.i.f. U.K. ports; brown, about £40 5s. per ton, c.i.f. U.K. ports; white crystals offered on spot at about £43 15s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

POTASH, CAUSTIC.—88/92%, solid quality quoted £28 15s. per ton, c.i.f. U.K. ports, minimum 15-ton lots. Under 15-ton lots, £29 10s. per ton. Liquid, £15 per ton, minimum 15-ton lots. Under 15-ton lots £15 7s. 6d. per ton, c.i.f. U.K. ports.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE.—96/98% quoted £27 5s. per ton, ex wharf, early shipment. Spot material on offer at about £28 10s. per ton, ex store.

POTASSIUM CHLORATE.—Powdered quality on offer at £24 5s. per ton, c.i.f. U.K. ports; crystals, £2 per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 12s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £21 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (YELLOW).—Rather quiet and spot material now offered at 6¾d. per lb., ex store spot delivery. Offered for prompt shipment from the Continent at a fraction less.

SODA, CAUSTIC.—Powder, 98/99%, £19 7s. 6d. per ton; 76/77%, £15 10s. per ton and 70/72%, £14 10s. per ton, carriage paid station, minimum 4-ton lots on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—English material quoted £21 10s. per ton, ex store. Continental on offer at £17 15s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 10s. per ton, ex store, minimum 4-ton lots. Continental on offer at about £8 2s. 6d. per ton, ex wharf, prompt shipment. Pea crystals of British manufacture quoted £15 5s. per ton, ex station, 4-ton lots.

SODIUM NITRITE, 100%.—Quoted £19 15s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—In moderate demand and price unchanged at about 4¼d. per lb., ex store. Offered for prompt shipment from the Continent at 4⅛d. per lb., ex wharf.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption, £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE.—Prices for English material as follows: 60/62%, solid, now £10 10s. per ton; broken, £11 10s. per ton; flake, £13 5s. per ton; crystals, 31/34%, £7 10s. per ton to £8 5s. per ton, according to quality, delivered your works, minimum 4-ton lots on contract. Prices for spot delivery 5s. per ton higher for solid, 2s. 6d. per ton for crystals. Offered from the Continent at about £9 5s. per ton c.i.f. U.K. ports; broken, 15s. per ton extra.

SULPHUR.—Flowers, £12 10s. per ton; roll, £11 per ton; rock, £11 per ton; floristella, £10 per ton; ground American, £9 5s. per ton; ex store. Prices nominal.

ZINC CHLORIDE.—British material 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material now quoted £11 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Intermediates

PARANITRANILINE.—1s. 8d. per lb. Some inquiries.

N.W. ACID.—4s. 9d. per lb. per 100%. Small inquiries.

ANTHRANILIC ACID.—6s. per lb. Some inquiries.

A Japanese Shale Oil Experiment

AN experimental shale oil furnace has been established at the Fushun collieries in Japan. It is 3 ft. in diameter and 50 ft. high, and has a capacity of 40 tons. Of the internal-heating type, it is so designed that the gas will be returned to the furnace for re-use. If this furnace comes up to expectations, the plan is to build 47 additional 40-ton furnaces. It was found at the Tokuyama fuel depot that, by mixing one part of the shale oil produced at the Fushun collieries with two parts of crude Borneo oil, a product was obtained that would be satisfactory for marine purposes. An annual output of 25,000 tons of shale oil is expected.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, July 28, 1927.

The demand for chemicals on the Manchester market this week has been on a fair scale considering the time of the year, for this and next week together are usually regarded as one of the slackest periods throughout the twelve months. Home users are buying certain of the leading "heavy" products in moderate quantities, and, for the most part, quotations keep steady. Bookings on this market for export, however, remain slow.

Heavy Chemicals

There has been no change in price level so far as prussiate of soda is concerned, offers remaining at about 4⅛d. per lb., though only a quiet trade in this material has been done this week. Bicarbonate of soda is fully maintained at £10 10s. per ton and business has been on a fair scale. Sulphide of sodium remains slow and quotations are easy, with 60-65 per cent. concentrated solid on offer at £11 5s. per ton and commercial at about £8 12s. 6d. Saltcake is still on the slow side, but values keep up at from £3 10s. to £3 12s. 6d. per ton. With regard to caustic soda, the demand for this material, both from home users and for shipment, is maintained at a fairly good level, and quotations are firm, these ranging from £14 10s. per ton for 60 per cent. to £16 10s. for 76 per cent. Nitrite of soda meets with a moderate inquiry, and values are steady at from £19 5s. to £19 10s. per ton. In the case of glauber salts, these continue in relatively slow request, with offers in the neighbourhood of £3 10s. per ton. Phosphate of soda meets with a quiet demand, and prices are fully maintained at round £12 15s. per ton. A quietly steady trade in alkali is being put through at firm prices, about £6 15s. per ton being quoted. Some inquiry for hyposulphite of soda has been reported, and quotations are steady at about £9 12s. 6d. per ton for the commercial product and £16 5s. for the photographic grade. A limited business has been done in the case of chlorate of soda at unchanged prices, though the tendency is still easy. Bichromate of soda is steady at about 3d. per lb., and a fair inquiry for this has been experienced.

The demand for caustic potash is moderately good, and values are well held, round £31 per ton still being quoted. Carbonate of potash is being offered at about £27 per ton, and buying interest in this is on a fairly satisfactory scale. A quiet trade in permanganate of potash is reported, W.B.P. quality quoted at about 6½d. per lb. and commercial at 5½d. Yellow prussiate of potash continues in limited request, and some weakness is apparent, current offers of this material being round 6¾d. per lb. Chlorate of potash is rather inactive, but at 3d. to 3⅛d. per lb. little actual change in prices has occurred. Bichromate of potash is steady and meets with a fair demand at about 4¼d. per lb.

A shade more interest in arsenic has been accompanied by a firming up of prices, from £16 5s. to £16 10s. per ton at the mines now being quoted for white powdered, Cornish makes. Copper sulphate is steady and meets with a fair volume of inquiry at round £25 10s. per ton, f.o.b. Nitrate of lead is steadier at £38 to £38 10s. per ton, and a quiet trade in this is being put through. Acetate of lead is slow, but about unchanged on the week at £43 per ton for white and £40 10s. for brown. Acetate of lime is on the short side, and offers of this are about maintained, grey being quoted at £15 5s. to £15 10s. per ton and brown at £8 10s.

Acids and Tar Products

Rather more interest has been shown in oxalic acid during the past week, and values are stronger, about 3¼d. per lb. now being the basis of current business. Tartaric acid is quiet, but prices are fairly steady at about 1s. 3¼d. per lb. Only a moderate trade is passing in citric acid, but here also quotations are held at 1s. 7d. per lb. Acetic acid is maintained at about £37 per ton for the 80 per cent. commercial product and £66 10s. for the glacial, inquiry being fairly good.

Among the by-products, creosote oil continues firm at 7¾d. per gallon, and an active business is being done. Pitch is attracting a fair amount of attention on forward account at round £4 5s. per ton, f.o.b., though prompt offers are scarce. There is little business stirring in the case of solvent naphtha, values of which are easy at 1s. 1d. to 1s. 2d. per gallon. Carbolic acid is quiet, but fairly steady at 2s. 4d. per gallon for crude material and from 8d. to 8¼d. per lb. for crystals.

Creditors' Meeting of Corbyn, Stacey and Co., Ltd.

A meeting of the creditors of Corbyn, Stacey and Co., Ltd., manufacturing chemists and wholesale druggists, Hunts Lane, Stratford, London, E., was held on Wednesday, at the Cannon Street Hotel, London, when Mr. W. H. Cork was elected to the chair. Mr. F. F. Sharles, the receiver for the debenture holders, submitted a statement of affairs which showed unsecured liabilities of £4,616 7s. 9d. The assets totalled £15,646 15s. 3d., and were estimated to realise £9,197 14s. 6d. There was a deficiency on the debentures of £1,440 3s. 1d. There were no assets available for the unsecured creditors, regarding whom the deficiency was set down at £6,056 10s. 10d. The issued capital of the company was £19,457, and as regards the shareholders there was a deficiency of £25,513 10s. 10d.

It was reported that the business was a very old-established one; the company went into liquidation in 1907, but was reconstructed. About 1916 a subsidiary company called the Corbyn Manufacturing Co., Ltd., was formed to produce a special article, but this subsidiary was finally wound up. The debentures were held by Mr. W. H. Robertson, who was a shareholder for £8,000, and from time to time he had advanced money on the security of debentures. The present position was attributed to lack of capital, losses, and expenses incurred in connection with the Hunts Lane premises. The receiver for the debenture holder did not think that a reconstruction could be effected. An offer of £9,000 had been received for the assets, which it was proposed to accept if a better one were not forthcoming. The offer would be insufficient to pay the debenture holder in full, and there would be nothing for the ordinary creditors.

Mr. Cork remarked that the financial position, so far as the creditors were concerned, was deplorable, and he inquired whether Mr. Robertson would agree to a composition of 5s. in the £ being paid to the creditors out of the money realised from the sale of the assets. Mr. Robertson said he might be prepared to assist to the extent of offering a composition of 2s. 6d. in the £.

It was decided that W. H. Cork and Co., of 19, Eastcheap, London, should consider the matter on behalf of creditors, and that a committee of five of the principal creditors should be appointed.

Manufacturing Pharmaceutical Chemists' Affairs

The statutory meeting of the creditors of Symes and Co., Ltd., manufacturing pharmaceutical chemists, 14, Hardman Street, Liverpool, was held last week, at the offices of the liquidator, Mr. W. S. Deyes, in Liverpool. The statement of affairs presented disclosed ranking liabilities of £2,543 18s. 10d. The assets were estimated at a gross value of £1,494 14s. The net assets were £1,330 4s. 5d., or a deficiency, so far as the creditors were concerned, of £1,213 14s. 5d. The issued capital of the company was £7,200, and as regarded the shareholders there was a deficiency of £8,413 14s. 5d.

The chairman reported that the company, formed in 1894, was a public one with capital of £10,000 of 2,000 shares of £5, 1,440 of which had been issued and were fully paid.

The liquidator stated that in December, 1922, under certain arrangements, another company took over the management of the business. There was a loss on the profit and loss account in 1921 of £1,215. During the next four years the loss was substantially reduced and a small profit was made in 1926. The matter was discussed at some length, and a resolution was submitted in favour of the appointment of Mr. P. S. Booth, of the Association of Manufacturing Chemists, 2, Bixteth Street, Liverpool, as liquidator. No definite resolution, however, was passed.

Sales of Chilean Nitrate

Sales of Chilean nitrate, under the free-selling system, during the fortnight ended July 15, amounted to 63,532 metric tons for delivery up to May, 1928, bringing the total of such sales, since the introduction of free selling on April 14 last, up to 1,097,766 metric tons. During the past week sales of nitrate on the coast, under the free-selling system, are reported to have amounted to about 4,660 metric tons, at prices ranging up to about 17s. per metric quintal for refined nitrate, and at around 16s. 6d. for ordinary. In addition, it is understood that 4,500 tons have been disposed of in London, for August-September delivery, at about 16s. 7d. per metric quintal.

Company News

SENTINEL WAGGON WORKS.—The usual interim preference dividend has been declared at the rate of 7¼ per cent. per annum, less tax, for the six months ended June 30.

BENN BROTHERS, LTD.—The directors recommend the payment of a final dividend of 11¼ per cent., making a total dividend of 17½ per cent., less tax, for the year ended June 30, 1927.

ENGLISH CHINA CLAYS, LTD.—The payment is announced, on August 2, of an interim dividend on the cumulative preference shares at the rate of 7 per cent. per annum for the half-year ended June 30, 1927.

GAS LIGHT AND COKE CO.—The directors have declared dividends for the half-year ended June 30 on the 4 per cent. consolidated preference stock at the rate of £4 per cent. per annum; on the 3½ per cent. maximum stock at the rate of £3 10s. per cent. per annum; and on the ordinary stock at the rate of £5 per cent. per annum. Last year the interim dividend on the ordinary stock was at the rate of £5 1s. 4d. per cent. per annum.

BRITISH COTTON-SEED PRODUCTS.—The accounts for the year to March 31, 1927, show loss, after writing off £170,403 from patent rights, preliminary expenses, depreciation, etc., of £178,363, increasing the debit brought forward to £189,690. At the meeting held on June 27, resolutions were submitted to reduce the capital from £250,000 to £43,750 by writing off 16s. 6d. per £1 share, and to reincrease it to £249,998 by creating 1,178,560 3s. 6d. shares. The resolutions, however, were not passed, but a committee is to be appointed to review the situation.

NEW PACCHA AND JAZPAMPA NITRATE CO.—The report for the year ended December 31, 1926, states that the trading loss amounts to £911, to which must be added closing down and stoppage expenses £6,566, London office expenses £1,262, and interest £340, making £9,080. After deducting transfer fees, £9, the result is a net loss of £9,071. Deducting net balance brought forward of £5,896 and income-tax reserve in excess of liability £2,391, there remains a debit on profit and loss account of £784. The annual meeting is to be held at 139, Dashwood House, London, on July 29, at 12.30 p.m.

TEHIDY MINERALS, LTD.—An interim dividend of 2½ per cent. (6d. per share), less income-tax at 4s. in the £, has been declared payable on August 10 to all shareholders registered in the books of the company on July 23. The directors paid a similar dividend at this time last year, and the final dividend was one of 3d. per share, making the total for 1926 4½ per cent. Last year's interim was the first dividend paid by the company, which was registered in February, 1919, with an issued capital of £294,000 in £1 shares. A profit was earned in 1926 of £140,082. After writing off offices, furniture, etc., and payment of the dividends, £8,155 was carried forward.

British Alizarine *v.* Major and Co.

THE appeal by the plaintiffs in the action of the British Alizarine Co., Ltd., *v.* Major and Co., Ltd., tried by Mr. Justice Mackinnon in the King's Bench Division was mentioned last week in the Court of Appeal. The plaintiffs entered an appeal against Mr. Justice Mackinnon's judgment in favour of defendants on a claim by the plaintiffs arising out of a contract for the supply of anthracene. Plaintiffs are manufacturers of synthetic dyes, of Manchester, and the defendants tar distillers, formerly of Hull. The plaintiffs claimed a declaration that the defendants were not entitled to deliver anthracene other than that produced by the defendants. Defendants denied that they ever said they would deliver anthracene only of their own manufacture. Defendants bought no anthracene abroad. Mr. Justice Mackinnon found for the defendants and plaintiffs entered their appeal.

Mr. Clement Davies, K.C., and Mr. Dickinson appeared for the appellants, and Mr. Le Quesne, K.C., and Mr. Somerville for the defendants.

Counsel announced that the parties had arrived at a settlement of the dispute and by consent the appeal would be withdrawn.

The Court approved of this course.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to August 20, 1927.

"MY LADY."

480,637. Class 4. Dyes. The Firm, trading as Associated Products Co., 51, Smith Street, Whiteinch, Glasgow, manufacturers. May 13, 1927.

"SANDOPTAL."

481,307. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives.

481,308. Class 2. Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes.

481,309. Class 4. Raw or partly prepared vegetable, animal and mineral substances used in manufactures. Chemical Works, formerly Sandoz (a company incorporated under the laws of Switzerland), 60, Fabrikstrasse, Basle, Switzerland, manufacturers. June 7, 1927. (To be associated, Section 24.)

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICALS.—The managing director of an Australian company is at present in this country, and desires to get into touch with British manufacturers of chemicals, machinery, etc., who wish to develop their trade with Australia. Replies should be addressed to the Official Secretary, Commercial Bureau, Australia House, London. (Ref. No. 471.)

FILTRATION PLANT.—City Council of Port Elizabeth are inviting tenders for the supply and erection at Bulk River of a complete pressure type filtration plant of a capacity of 1,400,000 gallons of water per day. Tenders must reach Port Elizabeth not later than noon on Thursday, August 25, 1927. Further particulars may be obtained on application to the Department of Overseas Trade. (Ref. A.X. 4972.)

Tariff Changes

BRITISH INDIA.—A notification of June 11, superseding that of February 12, prescribes revised provisions for controlling transhipment of raw, prepared, and medicinal opiums and other drugs and similar substances.

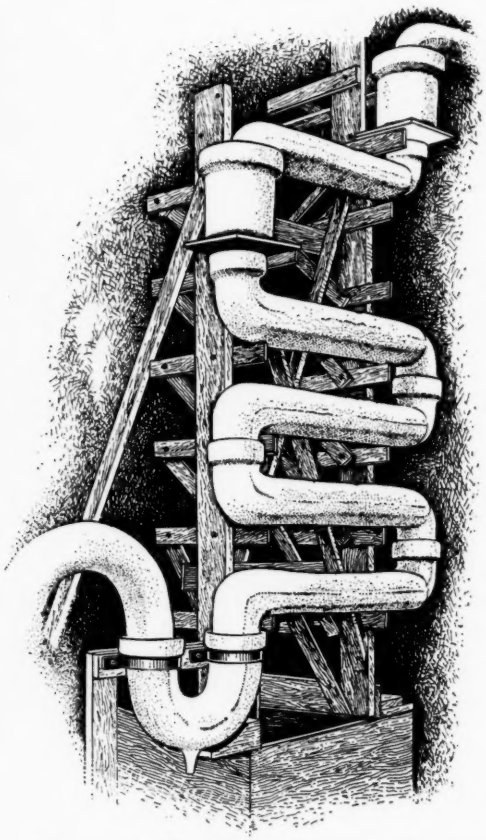
MONTSERRAT.—The Dangerous Drugs Ordinance repeals the Opium Ordinance, and provides for the regulation of import, export, manufacture, sale, and use of opium and other dangerous drugs.

PERU.—Cresylic acid, if imported for industrial use in uniform quantities exceeding 500 kgs., has been added to the list of articles for industrial use which may be cleared through the Custom House on payment of a duty of 10 per cent. *ad valorem*.

American Gypsum Industry

THE gypsum industry in 1926 was not quite so productive as in 1925, according to a statement by the United States Bureau of Mines. The quantity of gypsum mined in the United States in 1926 was 5,635,441 short tons, a decrease of 42,861 tons, or less than 1 per cent., compared with 1925. This production, except for that of 1925, was the largest recorded, and was twice as large as that of 1916. The total value of the gypsum sold or used by producers was $46,721,219, a decrease of $856,021, or 2 per cent., compared with 1925. This was the largest value recorded except that in 1925. The quantity of gypsum sold by producers without calcining in 1926 was 961,363 short tons, a decrease of 52,772 tons, or 5 per cent., and was valued at $2,509,885, or $2.61 per ton; the quantity of calcined gypsum sold or used by producers was 4,015,974 tons, a decrease of 80,383 tons, or 2 per cent., and was valued at $44,211,334 or $11.01 per ton. New York continues to be the largest producer of gypsum.

The "VITREOSIL"



COLUMN OF "VITREOSIL" ABSORPTION VESSELS.

System of HYDROCHLORIC ACID ABSORPTION

THESE VESSELS set up Vertically one above the other can be thoroughly Water Cooled.

Economies of Floor Space and Efficiency of Operation are secured. There are no submerged joints.

In this System an intimate contact of the gas with the liquid is secured by means of the liquid curtain formed by the drops falling from the central depression and through which all the gas must pass.

Let us know your Problems

WRITE FOR DESCRIPTIVE LITERATURE

Specialists in Chemical Works Plant

SOLE MANUFACTURERS

THE THERMAL SYNDICATE, Ltd.

VITREOSIL WORKS

WALLSEND-ON-TYNE, ENGLAND

LONDON DEPOT: 28 Victoria Street, S.W.1

AND AT NEW YORK *and* PARIS

Telephone Nos. 42 & 43 Wallsend. *Telegrams: "Thermal, Wallsend"*

ABC Code, 5th & 6th Editions, & Bentley's used

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BAKER, F., AND CO. [a firm], Camgate Works, Stanwell, soap and soap powder manufacturers. (C.C., 30/7/27.) £42 15s. 4d. June 20.

Deed of Arrangement

MURDOCK, Joseph, trading as STEEL AND CO., 29A, Stretton Street, Nottingham, wholesale druggist. (D.A., 30/7/27.) Filed July 21. Trustee: E. H. Palmer, Bentinck Buildings, Wheeler Gate, Nottingham, C.A. Secured creditors, £60; liabilities unsecured, £329; assets, less secured claims, £165.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

HARKER (C. R.), STAGG AND MORGAN, LTD., London, E., chemists. (M., 30/7/27.) Registered July 13, £1,500 debentures; general charge (2nd charge). *£65,000. September 29, 1926.

PALATINE CLEANERS, LTD., Manchester. (M., 30/7/27.) Registered July 16, £5,000 debentures; general charge. *£2,500. March 19, 1926.

SERRE (ACHILLE), LTD., London, E., dyers. (M., 30/7/27.) Registered July 14, £3,000 mortgage, to R. H. Bibbs, 1, Bromwich Lane, Worcester, retired storekeeper; charged on 22, The Cross, Worcester. *£10,200. March 30, 1927.

Satisfaction

INTERNATIONAL CHEMICAL CO., LTD. (late INTERNATIONAL CHEMICAL LABORATORIES, LTD.), London, N.W. (M.S., 30/7/27.) Satisfaction registered July 18, £10,000, part of amount registered. April 27, 1926.

London Gazette, &c.

Company Winding Up Voluntarily

HENRY HOLROYD AND CO., LTD. (C.W.U.V., 30/7/27.) J. A. Couper, Liverpool Bank Chambers, 30, Park Row, Leeds, Chartered Accountant, appointed as liquidator, July 16.

New Companies Registered

ANGLO-CONTINENTAL FULLER'S EARTH CO., LTD. Registered as a "private" company on July 21. Nom. capital, £1,000 in £1 shares. To carry on the business of manufacturers, importers and exporters of and dealers in fuller's earth and other products or commodities for oil refinery, natural products of all kinds, chemicals, phosphates, fertilisers, lime, cement, nitrates, etc. Directors: Hans Becker, c/o Herm Ernst Koch, 28, Wasmannstrasse, Hamburg, Germany; Betzy Hirsch, and Ernest Koch.

P. E. ROBINS, LTD., Bassishaw House, Basinghall Street, London. Registered July 21. Nom. capital, £5,000 in £1 shares. Merchants, dealers, or commission agents in tinplates, sulphate of copper, and other chemicals, aluminium, solder ingot and bar tin, nickel, and cement, and to adopt an agreement with Jepson Bros. and Co., Ltd. Directors: J. R. Jepson, 104, Maple Road, Surbiton, and H. F. George.

SOLIGNUM, LTD. Registered as a "public" company on July 21. Nom. capital, £150,000 in 100,000 8 per cent. cumulative preference shares of £1 each and 200,000 ordinary shares of 5s. each. To acquire from Major and Co., Ltd., the goodwill of the "Solignum" branch of their business, and to carry on the business of manufacturers of, contractors for and dealers in chemicals and all chemical products, dyes and dyestuffs, tar distillers, manufacturers and sellers of patent and other medicines, etc. Subscribers: S. N. Carvalho, 6, Drapers Gardens, London, and S. W. King.

"Titanium White"

CANADIAN ilmenite ores will soon be used in the manufacture of a pigment called "Titanium White," according to Mr. R. H. Monk, Montreal, who told the Toronto Club of Paint and Varnish Manufacturers that plans are nearing completion for the erection of a plant in Montreal. If everything developed as expected, erection of the plant would be made during the autumn of this year. Ilmenite, of which there are large deposits in the province of Quebec, notably at Ivry and St. Urbain, contains iron and titanium oxide, and the first part of the process of manufacture is to separate these constituents. The iron is recovered as a by-product in the form of electrolytic iron and the titanium oxide is then combined with barium carbonate, made from Canadian barytes, to produce the new white pigment which is chemically barium titanate. Paints made from "Titanium White" are claimed to have great covering power and their manufacture in Canada will represent a new and important use of Canadian mineral deposits.

A Canadian Osmose Sugar Process

AN important process was recently added to the beet sugar industry at Raymond, Alberta, when machinery was installed to recover sugar from molasses. Despite heavy consumption by livestock, a surplus of molasses has been accumulating and this will now be converted into Osmose sugar through the addition of an Osmose plant with 26 presses at the Canadian Sugar Factories. The factories have started a sixty-day run to convert the surplus molasses into Osmose sugar, and during the autumn run it will be made into the edible variety. A payment of an additional 50 cents per ton for beet delivered during 1926 has recently been announced. This means the distribution of about $20,000 in the beet-growing area. The beet growers will then have received $7.25 per ton or $1.25 over the 1925 price. Higher sugar contents and higher prices have made this rise possible.

Benn Brothers' Other Journals

THE CABINET MAKER.—Direct Trading; Illustrated News for Woodworkers; Industrial Designs Competition.

DISCOVERY.—Shakespeare Number: "Shakespeare's Youth: A New Theory and its Critics," by Arthur Gray, M.A.; "Cultivation of Antique Flowers," by F. A. Hampton; "Afterthoughts on the Total Eclipse," by Dr. A. C. D. Crommelin, F.R.A.S.; "Bird Watching in the Shetlands," by M. G. S. Best.

THE EXPORT WORLD.—"Organising an Export Department," by J. A. Dunnage; The Finance of Foreign Trade; World Motor Markets Analysed; Insights into British Industry—II. Motor Boat Building.

THE ELECTRICIAN.—Annual Marine Number: "Electricity and Ship Propulsion," by A. C. Hardy, B.Sc., A.M.I.Mar.E.; "Synchronous Motors for Marine Use," by C. Rettie; Navigational Wireless; Auto-Alarms for Ships; "Quad Telephone Cables," by A. Morris, A.M.I.E.E.; "Women and the Electrical Showroom," by Burnaby Mayfield.

THE FRUIT GROWER.—The Man and His Work; An Examination of Glasshouse Activities; Opening of Vegetable Canning Station at Wisbech (illustrated); West Cambridge Growers visit to Seabrooks and Sons, Ltd.

GARDENING ILLUSTRATED.—Roses in July; The Exhibition of the London and South of England Viola and Pansy Society, Herbaceous Peonies; Summer Pruning of Fruit Trees; Some Flowers of Le Lautaret.

THE GAS WORLD.—Education in the Gas Industry; American Methods of Main Laying; Manchester Gas Engineers' Visit to a Chemical Works.

THE HARDWARE TRADE JOURNAL.—Tightening up Trade Education; Imported Iron and Steel Wire and Nails: The Merchandise Act Inquiry; More about File Manufacture; Chromium Plating; Developments that have Eliminated Uncertainty.

THE TIMBER TRADE JOURNAL.—Collection and Utilisation of Wood Refuse; In Defence of Wood; Its Lasting Value as a Constructional and Decorative Material; An Interesting Demurrage Case.